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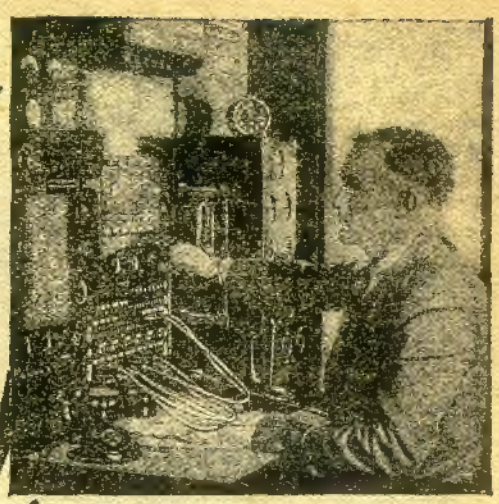

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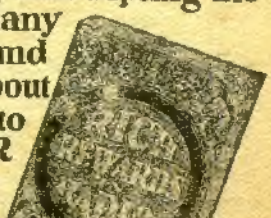

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AMAZING STORIES

April, 1930
Vol. 5, No. 1

Experimenter Publications, Inc.
H. A. Mackinnon, Pres. H. K. Fly, Vice Pres. and Treas.

In Our Next Issue:

THE UNIVERSE WRECKERS, by Edmond Hamilton. (A serial in 3 parts) Part I. We are inclined to take everything for granted—particularly the courses of Nature. There is, after all, no absolute assurance that the sun, for instance, should continue indefinitely to turn at its present speed. What would be the final result of the centrifugal force if the sun started to turn more and more rapidly? What would happen to the planets which rotate around this great luminary? Mr. Hamilton needs no introduction, but we do want to say that this surpasses the best interplanetary story by him that we have yet published. Read the first instalment in the May issue.

MADNESS OF THE DUST, by R. F. Starzl. Although this story was written some time ago, an extract taken from "The New York Times" of December 21, 1929, gives almost word for word a similar description of an operation performed by a ship's Captain, following radio instructions from a physician. How then, can we say anything is impossible? But this is only an incident in an unusual story, excellently told, and which contains a good bit of science.

THE IVY WAR, by David H. Keller, M.D. Here is a new story by Dr. Keller, based on the always interesting subject of botany, dealing with a subject that is little known as yet. The "Ivy War" goes on in the good old Keller manner, which some of our readers seemed to have missed recently. It is absorbingly interesting and plausible, withal.

SYNTHETIC, by Charles Cloukey. By this time, Mr. Cloukey has become a familiar and well-liked author in AMAZING STORIES. In this story, he offers us an exceedingly clever, swift-moving aviation exploit of the future that shows good imagination and excellent knowledge of his subject. (Crowded out of the last issue.)

THE NON-GRAVITATIONAL VORTEX, by A. Hyatt Verrill. Here is another of Mr. Verrill's extraordinary scientific tales, based on the local annihilation of gravitation.

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Our Cover

this issue depicts a scene from the story entitled, "The Conquest of the Earth," by Isaac R. Nathanson, in which the representative of the strange intelligent beings from the nebula of Andromeda is pointing out to the unsuspecting earth people, on a screened easel-like stand, on which it has a picture of the nebula, just where they come from.

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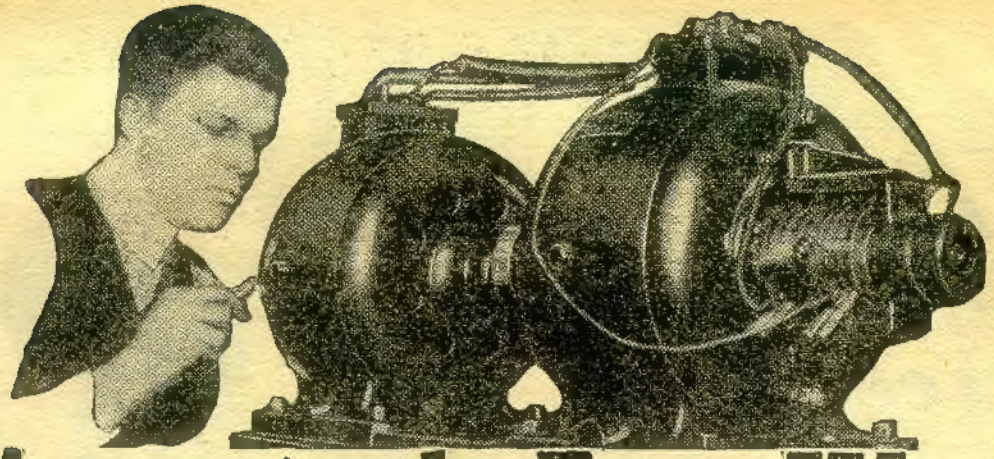

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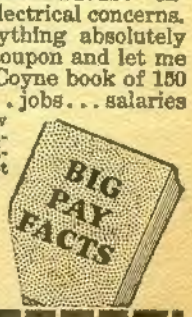

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VOLUME 5

AMAZING STORIES

THE MAGAZINE OF SCIENTIFICTION

APRIL, 1930 No. 1

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Extravagant Fiction Today - - - - - - - - - Cold Fact Tomorrow

Natural Sources of Power

By T. O'Conor Sloane, Ph. D.

THE great watershed, which supplies the lake region of America, beginning with Lake Ontario and extending to the west end of Lake Superior, represents, if we take it in one unit, one of the biggest in land or seas of all the world. All the water from this great watershed, which reaches the eastern end of Lake Erie, falls in one mighty cataract over Niagara Falls. There is an enormous evaporation from these lakes, but a very large fraction of the water which falls into them goes in one concentrated mass—or let us say, two concentrated masses—over the precipice of Niagara, the Canadian Falls and the American Falls, separated by Goat Island. To the engineer it represents nothing more nor less than a wonderful source of water power. To him its scenic value means nothing. He is apt to forget that this very scenic value has brought millions of dollars from visitors to the region in the past century—for tourists and the proverbial wedding couples have visited Niagara in enormous numbers. But the engineer would take away all the water, would run it through tunnels, drive turbines with it and use it for the production of power.

Many years ago it was considered a crime to charge interest for money. It was called usury. The idea, of course, was that money did not suffer in use. If you loaned a man 100 shillings, for instance, when it was returned, you got 100 shillings back, none the worse for wear. But now money has a definite value for its use. Money now makes money, and the money which does your earning is given the name of capital. And this capital plays a very curious part in evaluating natural sources of power, wind, or water; yet it may be made the servant of man. For the production of the same amount of power, a hydro plant may cost a great deal more than a steam plant would cost for the development of the same quantity of power units. The water-power plant, it may be said, uses up nothing, because the water is supplied from natural sources. It is drawn up by the heat of the sun, precipitated in regions distant from the water-power station, pours down over the watersheds, through all the streams and rivers, and reaches at last the desired place and there develops power, we may say, for nothing—at least, for nothing as far as the consumption of the water is concerned. But there is a very heavy cost in interest on the capital that would have to be invested in the plant.

In very many places—perhaps in the majority of cases—a steam plant, although it uses up coal and demands constant labor to care for the machinery to do the firing under the boilers—all more pro rata than is required in a hydro plant—yet it saves on the interest of the money invested, because this money is much less than the cost of the corresponding water plant. This is not universal, but it occurs frequently enough to make it a recognized fact that steam power driven by coal, mined and dragged up from the bowels of the earth, fired by hand or by automatic stokers, is really cheaper than where nature hands us over all the power we want in the shape of flowing water, such as we see at Niagara Falls, or in nearly as impressive a way in the rapids of the St. Lawrence River.

In other words, that mighty watershed could give us any number of power stations; but the power stations would probably cost so much that steam power would be cheaper.

Going down the St. Lawrence River from Niagara Falls to Quebec the Great Rapids which drive down through the wide channel with such resistless force, offer an opportunity for any number of power stations. Thus in a sense the water from the Great Lakes can be used over and over again. If we go to the head of Lake Michigan at Chicago there we find some of the water diverted from its proper course and discharged into the head waters of the Mississippi River, running down to the Gulf of Mexico instead of taking its proper course to the Gulf of the St. Lawrence. Here, too, a hydraulic power station could be placed which would give a practicable amount of power.

We are constantly hearing of different chances for the establishment of power plants driven by water, and all sorts of claims are made that these should not be monopolized by private companies; that they should be for the service of the people and be under government ownership. Government ownership generally turns out to be a very expensive luxury. But that, of course, is a side issue. The fact remains that proper steam plants in many cases are cheaper to run than are hydro plants, because of the diminished capital required in many cases. Often to secure water power, an enormously expensive dam must be built and that is only the beginning of things, because the power plant itself with turbines and electric generators in its interest on the capital costs far more than the coal which would be consumed by a steam plant of equal power.

Natural sources of power of enormous amount in the aggregate are being discarded, or what is not quite as bad, are not being utilized. The power of the wind which brought Columbus to America is now being used less and less. Steamships and motor-driven vessels are sent across the ocean and no consideration is applied to the wind, and while there may be a gale blowing behind them, which certainly would add to their speed, it is not thought worth while to provide the plant in the shape of masts and sails to utilize this power. Windmills which at one time were, relatively speaking, quite numerous in Holland and in England, and of which there are many in America, they too have been put into the discard to a great extent. But wind and water are only two of the natural powers which man has found it apparently expedient to neglect. Natural powers are waiting for us all over the earth, but presumably will hardly ever be used to any extent as long as coal and oil are as abundant as they are today.

The Metal Horde

By John W. Campbell, Jr.

Author of "When the Atoms Failed."

WHAT with calculating machines and robots and now perhaps even mechanical airplane pilots, there seems no limit to the possibilities in the realm of working machinery. We have seismographs that can locate the place of distant earthquakes, and machines that can solve, in a comparatively short period, problems in the higher calculus that would otherwise take brilliant mathematicians an endless time to do. It seems to us quite logical that machines might some day, perhaps in the distant future, be developed to solve for our scientists now apparently insoluble problems. Or they might even be made to state their own problems and work them out—in other words, it might some day be possible to have a machine with almost a working brain. According to our author, this will be possible and his final explanation of his idea is exceedingly clever and novel. There is no question Mr. Campbell knows his science and he has by this time proved his ability to weave a great deal of sound science into an absorbing scientific fiction story of exceeding plausibility.

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IT would seem lack of generalship that permitted them to be discovered so soon, for had we not picked up those signals from the ether we should not have received that warning that meant so much to us, and it might well have been that this system would have acquired a new population. For it would have needed but little to shift the balance the other way! Once I watched Steven Waterson save the civilization of the Earth, but now I saw him in a greater rôle, for it was he who made possible the defeat of the Sirians. But even had his brilliant mind succeeded in working out the problem of the de-activating field without the precious hours gained by that warning, many millions more would have died before they could have escaped from Mars.

I was in his laboratory at the time he received the messages from the System government telling the import of those strange tone-signals out there in space. I seem fated to be with that man every time some great event breaks on the System. I was with him when Dr. Downey announced his discovery of the secret of old age—or, better, its prevention. Waterson was forty-two now, in years, but in body he was still twenty-eight for it was late in 1947 that he had taken Dr. Downey's treatment.

Those strange tone-signals had been heard faintly for days, but it was not until July 8th, 1961, that they were located in space, and then man began to realize something of the message they might bear.

Waterson asked me to accompany him to the System Capital on Venus, and I was present at that first Cabinet meeting, and at each succeeding meeting. Again I was close to the facts—and again Waterson has asked me to write a chronicle of that terrible War.

It was not till the signals had definitely been located as originating far out in space that man began to take more than a mildly curious interest in them. They were coming from the Metal Horde that was even then sweeping across space at a thousand miles a second to the planets ahead.

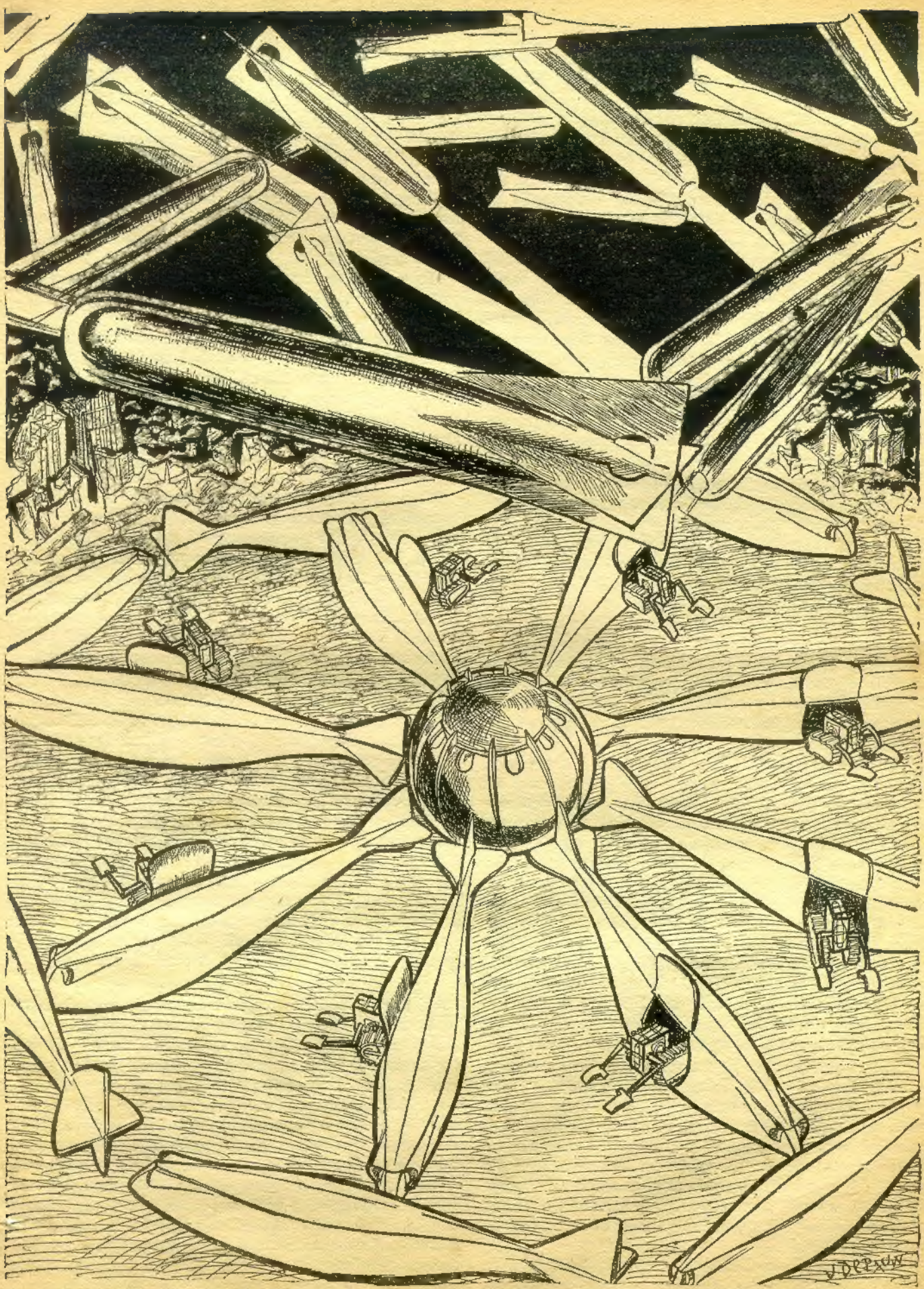
Their goal of ages was in sight. Sixteen hundred years of ceaseless rushing flight had at last brought them near.

When our ancestors were beginning to grumble under their Roman lords, in the time of Horlak San, when his mighty armies were sweeping their way across Mars under the newly developed heat rays, spreading death and civilization at one time, that menace started on its expedition.

When the Normans invaded England, when the mighty empire that the San dynasty had maintained over all Mars was crumbling, that journey was half done.

When Columbus first set foot on the shores of America, when Koral Nas formed the great union of the federated nations of Mars, that trip was three-quarters done.

But it was seven-eighths completed when Mars developed the first crude atomic engines, and when Priestly of England discovered oxygen. And during the two



¶ *The great sphere and its attendant transports sank gently to the ground and formed a vast wheel, with the sphere as the hub and the transports as radiating spokes and the rim*

centuries of flight that remained before they reached their goal, there developed on those tiny planets the instruments that were to throw that mighty force down to defeat.

But I am to tell you of that war as I saw it; we have all seen it—all too closely! It was really but a little more than a month that that Menace of Metal hung over us there on Mars, but to us it seemed years, except to the frantically working scientists, striving desperately to discover some weapon to defeat them. David Gale.

A TINY glistening mote in space it was, as it sped toward the shining planet before it—the rapid flight of the car aided by the gravity of Venus. The call had been urgent, and the Earth had been in superior conjunction, that meant a full twenty-hour trip, even at 1000 miles a second, but now they were approaching the planet and the pilot was losing speed as rapidly as possible. There was a limit to what he could stand, though, and it took him many thousands of miles to bring the machine down to a speed compatible with atmospheric conditions of the planet.

The air of the planet seemed thick with traffic, mighty half-million ton lift freighters and passenger ships setting out toward Earth, smaller private machines, but none were slower nor faster than the others, for all were limited only by the acceleration they could stand. There was only one speed limit, that of economical, safe operation, for with all space to move in, there was no need of speed laws. Yet it seemed impossible to make any more than two thousand miles an hour through this slow moving air traffic—then there shone a little emblem on the bow of the little iridescent metal ship, and a huge freighter swerved respectfully aside. As by magic a lane opened through the thick traffic as the sign of the System President shone out.

The little ship darted along the ground a short way, then rose vertically, only to settle lightly on the roof of the great System Capitol. Two men came out and walked quickly to the elevator entrance, where three guards, armed with disintegration ray projectors, greeted them with a stiffly military salute. The larger of the men responded with a smile, and a brief salutation in the common language of the System, for these great men were Martians, each well over eight feet tall. They entered the lift, and quickly sank down one hundred and fifty stories to the Governmental Offices. They proceeded directly to the great Cabinet chamber, down through the long halls, lined on each side by huge murals depicting scenes in the history of the three planets. Then they came to the cabinet room and entered.

Thirty-nine men were seated there now, but as the two entered, they rose, and waited for the President to be seated. The forty greatest living men were in that room that day and all worked together, for they were scientists who had learned the value of cooperation. There was no rivalry, for each was the greatest in his own field and had no aspirations toward any other branch of science. And none but conceded the power of the Presidency gladly to the greatest of them, Steven Waterson of Earth.

"Gentlemen of the Cabinet, I am beginning to believe it is time we had something added to the Constitution forbidding Members of the Cabinet to rise on the entry of the President." Waterson deeply appreciated that compliment, as they all knew, but he could not feel at home in an atmosphere of diffidence. He was a scientist, a planner, not a diplomat. "I am sorry I was forced to make you gentlemen wait for me, but as you see," he continued, pointing to the great map of the System on the ceiling of the Cabinet chamber, where the slow motion of the planets in their orbits was being accurately traced, "Earth is in superior conjunction at present, and I could not make better time.

"I see from this memorandum that has been prepared for me that Mansol Korac, Martian Astro-physicist, is to be our first speaker. I take it you have had no official discussion as yet?"

He was correct in this assumption for the men had convened shortly before at his radio announcement that he would land within an hour.

Some years before there had been some agitation to have the Cabinet meetings carried on by Radio-vision plates, but the low speed of light had made the speeches a terrible failure, as they would frequently have to wait ten or even fifteen minutes while the radio messages were reaching them. Over short distances that method was practicable, but between planets light is too slow, it cannot be used.

"Some time ago our radio engineers developed a new instrument for detecting exceptionally short waves. They really came under the category of the longer heat radiations, but were detected electrically. While experimenting with this device they have been consistently picking up signals apparently originating in free space. At first these signals were exceedingly weak, but their intensity has grown uniformly and rapidly, and from the results some amazing conclusions have been drawn.

"They are originating at some source or sources out in space in the direction of the sun Sirius. I was asked to help the radiation engineers under Horus Mal in the calculation of the Astro-physical aspect of the problem. I believe that there are some man-made vehicles out there in space sending those signals. No man of the System has ever had reason to venture beyond the orbit of Neptune for any great distance; there would be no reason for it, as none of the outer planets are habitable. The rate of increase of the signal strength, coupled with observations made from Earth, Mars and Venus, have made it evident that they are at present about one and a quarter billion miles away, but approaching us at the rate of 1000 miles a second. This means that in approximately two weeks they will reach our planets.

"AS to their point of origin we can only make guesses really. They are coming toward us with Sirius—and thousands of other stars—at their back. Of all, Sirius is the nearest, being approximately nine light years away. This means that they must have spent at least 1600 years on that trip across space. Dr. James Downey of Earth has recently shown us how to lengthen life almost indefinitely, so the problem of old age need not be considered. A supply of air and water would, of course, be no great problem with the Waterson apparatus for electrolyzing CO back to carbon and oxygen, using atomic energy fuel. Water, of course, is merely transmuted and recombined and thus automatically purified for use. A sufficient reserve of very dense materials could easily be carried that would make up for any losses by transmutation to the necessary gases. As yet we have not been able to make foods from energy, carbon, and oxygen and hydrogen, but I believe you, Dr. Lange,

have made very considerable progress along that line, have you not?"

"I intended announcing at this meeting," said Dr. Lange, "the development of a commercial method of manufacturing any one of the sugars and several proteins directly from rock or water, by a transmutation and building-up process. The method has been developed."

"Then," continued the Martian, "there would be no need of carrying any great amount of food. That problem is settled.

"As there would be no resistance encountered in space, once the machine had been accelerated to its definite speed of 1000 miles per second, on leaving Sirius it would be able to make the trip across space with no expenditure of energy, until it reached its goal and slowed down to the speed of a planet. Hence no great amount of matter-fuel would be needed to drive the machine.

"But the problem of heating seems to me to be insoluble. Interplanetary space we have the radiations of the sun to depend upon, and they are decidedly sufficient, usually superfluously so. But in the infinite depths of interstellar space, there is only darkness and a perfect reservoir for radiations. There would be continuous cooling by radiation, and no sun to warm the ship. I could understand how the ship might carry enough matter to warm it for one hundred years, but in sixteen hundred years so much energy must be radiated that the entire mass would not suffice. Nothing short of an entire planet would be sufficient. Polished walls would reduce the radiation, but still it would be too high. I can not understand it—unless these men can endure a temperature of but twenty or thirty degrees above absolute zero—then they could make it quite readily—but two hundred and forty degrees below zero Centigrade means that air—nearly everything would be solid, except a few rare gases. No it seems impossible—yet we have the evidence! I can not understand how they have made this terrible migration, but I know that there are many different units. I believe two thousand or more was the number you mentioned Horus Mal?"

"There seem to be a very considerable number of separate signals that we can distinguish. I consider the two thousand a very conservative estimate," replied Horus Mal, the Martian radiation engineer.

"Then," continued Mansol Korac, "we must decide on some plan of meeting them."

The Martian sat down and for some time there was silence in the great hall. At last President Waterson rose slowly to his feet. His face showed his concern. In times of emergency he always felt that these men here were responsible for the welfare of the twenty billions of human beings they controlled. And he was their leader, and therefore the responsibility was his.

"Mansol Korac, could you point out to us the approximate location of the approaching ships?" asked Waterson and handed him a small hand light and pointed to the great map of the system above them.

"I cannot be very exact, Mr. President; I do not know their location very definitely, but I should say about here, proceeding thus." The dazzling beam of white light stabbed up to the ceiling high above, and a sharp circle of light a foot across appeared, just within the orbit of Uranus, but well beyond Saturn. Then it slowly moved inward toward tiny glowing Mars. They were within the Solar System, but had not yet reached the Inner Ring of planets. Doubtless they who could make a trip across the great Void had the energy of matter at their disposal, and probably the disintegration ray. They would have no difficulty with the planetoids, they could merely beam them out of existence if they came too near.

The light snapped out, and each member of the cabinet turned toward Waterson again.

"Gentlemen, we see that they are within the Solar System already and appear to be heading directly for the Inner Ring, and Mars in particular, I do not know whether they come in peace or as invaders, but I think I can reasonably say that they are probably invaders. We all agree that they have made a trip of some 1600 years' duration. We all recognize the difficulty of such a trip. There are over two thousand ships in their fleet. I would not send so large a fleet to investigate the Outer Ring, but to send that great number of ships on a mere exploration trip of 1600 years—I do not think it is consistent. Then, too, we must allow them a life span of over three thousand years if we are going to padmit that this fleet is for exploration, for it would be three thousand two hundred years before they could bring back news of their trip. In the meantime they might well have been wiped out by some stellar catastrophe, or they might have developed means of seeing us directly in nine years, the time light takes for the trip. Much as we would prefer peace, I fear we must prepare for war. But we can always go out to meet them peacefully, in a great battle fleet. That might convince them that it is better to deal peaceably with us and it would at least be a protection. I suggest that we have a discussion on this, and take a vote."

But there was no discussion, and the vote was unanimous, for the President's suggestion was the logical thing. They had to be prepared for either peace or war.

Then came the discussion of weapons. There was pitifully little to discuss. The interplanetary patrol fleet was a mere police force, designed to destroy meteors, turn comets or asteroids. There was no real naval fleet. But mechanical devices had reached a great peak of perfection and the little space ships were so cheap, so easily operated, and so eminently safe, that nearly every family had several, and new ones were always in demand. There were mighty factories to meet this demand. Twenty billion people can absorb a tremendous number of machines. That was the greatest protection we had, and it was that quantity production, developed by the American, Ford, that made Waterson's campaign possible. But we were to learn much of quantity production methods before that war was over!

ORDERS were issued that evening to all the great plants over all three planets to begin work on a great quantity of ten-man-high speed ships. They were to be arranged with mountings for machine guns firing explosive bullets loaded with material explosive, each one equal to 100 tons of the old fashioned Dynamite, with special mountings for Dis ray machines. The disintegration ray machinery was to be built by the companies employed ordinarily in making private power plants, hand lights, and the jumping belts. These belts had small projectors that threw a directional beam of force that tended to deform the curvature of space, at that point, and the result was a force that pulled the projector forward, for the space before it acted like a spring. If a magnet be held near a steel watch spring, the spring

will bend, but it will try to straighten out and pull the magnet forward. If the magnet could pass through the spring it would progess, as the space curver apparatus was pulled through space. This was the principle of every ship now built, from these tiny two-kilogram (nearly five pounds) machines capable of lifting a man into the air, to the titanic new passenger-freight liners carrying as high as three quarters of a million tons.

The principle of the disintegration ray was not greatly different, and so the machines designed for turning these out in quantities were used to make the Dis ray apparatus with no great changes.

The heat ray projectors were made in quantities for every purpose, they were used for cooking, for welding metals, for warming the home, for melting down cliffs to make way for a building or a tunnel for water, for heating the mighty space ships, for anything to which heat might be applied to advantage. These would make very effective weapons but for the fact that heat rays could be reflected. They would bounce off the car of the enemy without doing any damage if it were polished, as no doubt it would be.

Great liners of space were requisitioned and fitted with Dis rays, and with mighty attractor beam apparatus that would grip and hold anything short of another liner. Each of the ten-man-cruisers had a smaller attractor beam by which they could grip an adversary and hold to his tail with the tenacious grip of a bulldog and yet not weary the pilot with violent movement. These ships were exceedingly powerful, and their speed was limited only by the accelerations the passengers could stand.

But all the scientists of the System were working desperately to design some new weapon, some new machine that was a little faster, a little more powerful; although with resistance in space and with the tremendous energies of matter at their disposal, there was little lack of power as far as the speed of the ships were concerned. Ten thousand times more powerful than the titanic energies of atoms, this energy had defeated the Martians that memorable day in May, 1947, and it was a full ten billion times more powerful than the energies of coal, of oil, of the fuels man had known before that day. But they needed a machine that could project the Dis ray farther. Twenty-five miles was the limit, beyond that the tremendous electrical field that was used to direct it must be built up to so high a voltage that there was no practical way of insulating it. They must be satisfied with the twenty-five mile range—but the scientists were working at increasing the range.

They had two weeks before the Sirians would reach Mars, and in those two weeks much was done. There was a very carefully laid out system in all notices; the absolute truth was laid before the public, but there was also laid before them the evidences of Man's power. There were no panics. This was no weird thing to them, the landing of a fleet from another world; it was as commonplace to them as the landing of a fleet from the other side of the ocean had been a generation ago. The element of the unfamiliar was gone, and with it had gone the element that produces panic, that reduces the efficiency of a nation or of a System.

New production machines had to be built, new designs worked out, new dies cut, but it was done with the quickness that a generation of mass production had made possible, it was not new to them, this change of design overnight.

It required most of those two precious weeks to get the great machines working once more at their tasks, but at last a steady stream of ten-man cruisers was being poured out, 5000 an hour, night and day, from the factories of three planets. But there was only one day to work before the Invaders would reach Mars, and the fleet was gathered, 120,000 ten-man ships, manned by the volunteers of three worlds.

But in the meantime Waterson had had built for himself a ten-man ship with triple strength of walls, and triple power plant installation, and an extra energy generator. He was experimenting with it, no one knew on what.

At last the invaders were seen. Far out in their course the scouts had met them. Those scouts were destroyed, without provocation; they did not even have time to finish their reports, but we learned enough.

Mars was a deserted planet now. All its population had moved to the other worlds. Most of them moved to Earth, on the other side of the sun. Only the workers in the great factories remained. They were not compelled to. They were told of the danger of their position, but those factories could contribute 1500 ships an hour, and they were manned. The fleet had gathered on Mars, awaiting the news of the Sirians, when the report of the scouts was flashed across the ether.

They told of a great horde of metal ships, shining, iridescent, ranging in size from tiny darting machines, ten feet long by one and three-quarters in diameter, mere torpedoes, to great transport ships. And there was a single spherical ship. A great sphere that floated in the center of a bodyguard of the thousands of its followers. There were literally hundreds of thousands of the little torpedo-ships, a few dozen of the cargo ships, and a few ships that seemed more like scouts of some sort. But it was apparent that the little torpedo-ships were the real fighters—tiny ships that spun and turned and darted like an electron in ionized gas. It seemed impossible that a man could stand those sudden turns at several miles a second, but they watched them, and went into nothingness as the Dis ray reached out from those tiny ships and caressed their ships.

They, too, had Dis rays—it would be a terrible battle, for man had that same force, a force so deadly they had feared to use it in industry. But man had the advantage of numbers.

The men on the fleet who saw those television plates glowing with the story of what was taking place out there in space decided that those torpedo-ships must be guided by radio. If they were it would be a simple matter to wreck that system by using a powerful interference that would drown out the directing wave and make its ships unmanageable.

The System Capital was temporarily moved to the Waterson Laboratories on Earth. There the forty men had gathered around great television plates and were watching the battle of the scouts. They were not to go to that battle front. The System needed them.

IT was midnight on the part of Mars where the Sirians first struck. The fleet of the Solar System was massed there to meet them. They seemed headed for the mighty gleaming city of Metal, below. Dornalus, the second city of old Mars; was there, and they seemed bent on reaching it. As the Sirians drew near they threw forward a great shield of the torpedo ships; then the great

generators on the Solarian fleet forced tremendous etheric currents into space, and waited to see the motions of the tiny ships become erratic, but they darted about as steadily, as easily as ever. These Sirians must be small men! And they must be from a massive world, a world that had accustomed them to great accelerations.

Below them the city was deserted except for vision projector machines that hummed steadily, automatically, from a thousand points. They were broadcasting the message to the worlds and to the commanding officers on the other side of Mars. These men had direct control of the battle. They could not control it from Earth, for radio waves travel too slowly. Twenty minutes each way the waves took and in forty minutes the battle was more than over. It lasted only fifteen minutes—minutes of terrific carnage!

As the two great fleets came into contact, the Solarians drove into the mass of tiny ships, their Dis rays flashing in every direction. They had one advantage in that they sprayed nine streams of death from each of their craft; but the torpedo-ships were so unbelievably fast that it was nearly impossible to hit them. And they seemed to have no compunction about raying one of their own ships if a more than equal amount of damage was inflicted on their enemies. Logical, no doubt, but how inhuman.

The sky above the city became a blazing hell of Dis rays, heat rays, and exploding shells. The explosives were not safe, for they threw great flying fragments that could pierce the wall of a ship and send it down. They damaged friend and foe alike.

The Solarian fleet had a solid projectile of a single giant crystal of copper that was immune to the Dis ray. It could penetrate the walls of a ship and bring it down. But the explosive bombs were more often than not exploded or merely disintegrated before they reached their goal. A crystal of any sort was immune to the Dis ray, but it was not a protection against it. There was no known way of deflecting the Dis ray except by that special electrical field that directed it, and that could not be made to surround a ship. The copper crystals were used mainly to destroy the Dis ray projectors of the enemy. They were fired at the faint glow, and with luck they would hit the machine and instantly wreck the projector. More than one machine disappeared as its own Dis ray projector, wrecked by the fifteen-inch copper crystal, suddenly spread in all directions.

The sphere and its escort of transports hung back, surrounded by a great number of the torpedo ships. They did not join in the fight.

And at last the Solarian fleet was recalled. It was not right that they should make such heavy sacrifices. The city must fall, and it would be easy to crush the Sirians with a larger fleet. At the rate of 5000 Solarian ships an hour, they might well do so in three days. So the Solarians left, and behind on the ground there were a few ships; a great number had been rayed into nothingness. The Sirians had won this first victory, but the Solarians could soon make up for this loss. They had twenty billions to back them up, and they had the resources of three planets. It seemed as though the invaders could not last long, but we had yet to learn the true meaning of mass production.

No man could hang around the encampment of that alien race. But above them television broadcasts were suspended, and some were installed in the buildings of the city. But these were of no avail, for the Sirians seemed obsessed with the idea of making Mars a true sphere. They proceeded to level the great city with Dis rays. No news projector could remain there, of course, and several news projector men lost their lives. It was foolhardy to stay in that city; they had been forbidden, but nothing will keep a newsman out of a chance for a scoop. The projectors which hung above continued to show a weird scene.

The great sphere and its attendant transports sank gently to the ground and formed a great wheel, with the sphere as the hub and the transports as radiating spokes and the rim. High above them the darting torpedo-ships were wheeling in constant circles. It seems a miracle that not all of those news projectors were destroyed, but some did last till the early rays of the sun set them off as shining targets for the flashing Dis rays. It was a weird scene they showed!

Now from the sides of the great transports came, not men, but great machines, machines that lumbered along on caterpillar treads to set themselves down beside their parent ship, one from each ship, and proceeded to dig themselves in, about three feet deep. Then all seemed quiet, except for a steady hum from the great machines, fifty-eight in all there were, great machines—fully two-hundred feet on a side. They worked there quietly now, and the men within them must have been totally covered, for they could not be seen. Apparently the Sirians dared not come out into the Martian atmosphere. And now something was happening that startled all the billions of watchers on the three planets. In the top of the great machines was a small trapdoor. Through this, there came a torpedo-ship that floated up a few feet, then darted off to join the wheeling machines above. Then eleven seconds later another came forth—another—each machine there was sending them out now. One by one those machines released a torpedo-boat—one every eleven seconds, with the regularity of a clock.

At first men could not grasp the significance of this—but soon it became obvious. These wonderful machines were complete factories in themselves, portable, mass production factories for producing those torpedo-ships, and one each eleven seconds came from the end of the production line, complete. The noises there were no longer a gentle hum. There was a whir and rattle of machines. It was not loud, though considering the mighty works that must have been going on inside. But steadily now, that darting fleet of torpedo-ships was increasing the power for all this work was obvious to these men who used similar processes in their work.

From the soil below them the machines dug masses of matter, and carrying it up into the machine transmuted its elements, into the elements necessary to their machines, then molded them, and automatically assembled them. It would require very little supervision, but that production rate was staggering! One each eleven seconds meant 325 completed machines an hour.

There were no signs of any men entering these ships, or the machines, so it seemed there must be some means of distant control that man knew nothing of, for it was improbable that all those men could have been in the parent machine from the beginning. No wonder the Sirians could lose these machines so freely. The ability to make them automatically from anything meant they cost practically nothing and could be produced in limit-

less quantity. The notion that Man was to be an easy victor was fast disappearing. These machines were coming to form an ever-growing cloud of wheeling ships. Still, man had destroyed fully half their fleet in that desperate struggle; they must spend some time in making up those losses. But Man had lost nearly a third of his great fleet. Four hundred thousand brave men had been lost. It was not even a victory, and it had cost Man far more than it had cost the Sirians. They had learned something from them, though. Perhaps radio control would enable man to do an equal amount of damage. Orders were put through to make an experimental fleet of thirty thousand radio-controlled machines.

IN the meantime a new thing was attracting the attention of the people on the planets. A new set of machines was issuing from the transports. These were smaller than that first set—low and squat—but they seemed far more flexible in their movement. They went off in orderly line to a point a few miles distant from the main encampment and there formed themselves into two groups. One group remained still, but began to glow faintly, and a hum came to the televisors above. Then there began to flow from a spout on the side of each a steady stream of molten metal. This was poured into a somewhat similiar arrangement on the other group, then these moved quickly away, and with their strange handlike appendages began to work quickly at a great rounded hull that was rapidly forming. The men watching understood. It was to be another cargo ship. Rapidly this hull grew under their swift manipulation, till it was completed in three and a half hours. An entire ship, except for the machinery, was completed. And now they began to work on another, and as they fell to work there started from the original cargo shops a long line of small, quick moving machines, machines that could run along the ground or drive through the air, and they were covered with arm-like appendages. Soon these reached the newly built hull, and quickly they were at work, getting material from the strange squat machines, entering the hull, and working at it. The second hull was nearly completed when one of the smaller machines flew back to the original encampment and went up to the sphere. From it it drew a strange metal case, oblong, from which led a great heavy cable. This it carried back to the now completed ship and installed it somewhere inside. Then the ship rose easily from the ground and floated around a bit, landed again, and immediately there came out of it one of the torpedo-ship machines! None of these had gone in, it had been made by those slim, quick worker machines! And now there lumbered out a second machine—one of the strange hull maker machines—then two of the worker machines came out, where only one had gone in. The ship was complete, even to its strange crew! And now that strange crew was already at work, making others!

With the coming of dawn the televisors were rayed out of existence. But that evening more were installed, and every night during all that invasion there floated above them those noiseless televisors. They destroyed many, but many remained.

That night showed us a fleet of nearly a half million of the tiny torpedo-ships, and a rapidly growing cargo ship camp. There were more than a hundred now, for as each was completed, the machines made could aid in the more rapid construction of the next.

And that night they began their work of leveling Mars. That great fleet spread itself out over all the surface of Mars, and with flaming heat rays and the terrible Dis rays they cut down every remnant of the Martian hills. Twenty-four hours later the entire planet was one vast featureless plain. And on that plain there had been established eight camps. During this time the cargo ships had been moving, and during that twenty-four hours they did nothing. But Man was prepared. The radio-controlled fleet was ready to be given its first try.

The entire fleet was assembled above the surface of Mars, above that original camp, where still rested the one sphere. Then from far out in space the great control ships directed the dive of the radio-control-ships, making the distance one-twentieth part of a light second. The men directing the ships were no faster than that, could not respond sooner, and the greater distance gave them greater safety.

But now the radio-controlled ships were released, and permitted to drop, uncontrolled. They wished to give the Sirians no warning. Then when the ships were scarcely ten miles from the Sirian fleet, they were brought under control, headed nose down in a power dive, straight through the surprised upper layers of the fleet, and with Dis rays glowing they drove straight for the ships below. Suddenly, there were great gashes in the ground beneath, and twenty of the cargo ships were gone in that first rush, and three more followed quickly. But while literally thousands of the Sirian torpedo-ships had been rayed, nearly half of the thirty thousand radio-controlled ships of Man were gone. And now they had to apply full power to prevent striking the ground. But twenty-two of them continued on in straight fall toward the great sphere. They were rayed by a hundred ships before they could get really separated from their companions. And now the fast radio ships were destroying hundreds of the Sirians, they were formed in a vertical column reaching up ten miles, one above the other, with the nine Dis ray projectors going full blast and spinning as rapidly as was safe lest the machines fly apart due to centrifugal force, for the Dis ray will work practically instantaneously. The top ship was preventing the torpedo-ships' attack from above. Suddenly each of the ships stopped spinning; its Dis ray went out and they dropped like rocks. The radio control had been drowned out by powerful interference; they were no longer under the influence of the men, and they had ceased to function. The radio-controlled-ships would no longer be useful against the Sirians.

NEARLY the entire fleet of the Sirian torpedo-ships had been wiped out by that spinning column. Now thousands of the manually-controlled ships dove down at the weakened fleet. Every one of the remaining ships shot up to meet the advancing fleet; there were still several thousand of the torpedo ships. And now the sphere rose with them, and among them. Suddenly the entire mass came together in the shape of a greater sphere with walls of torpedo-ships, and as it formed the torpedo ships snapped on their Dis rays, and started the entire surface of the sphere spinning! They seemed invulnerable in this formation, but they quickly moved away across the surface of the planet, the larger part of the Solarian fleet following, wondering what to do about it. It seemed impossible to attack the sphere of destruction.

But the cargo ships were left unprotected, and in a moment they had been beamed out of existence. The Sirians had lost many hours' work on this battle! And they lost more before the mighty fleet of torpedo-ships from the other camps rescued them. For now and then an explosive shell would penetrate the screen of disintegration rays. But within the outer shield was a second, virtually a shield of metal, for the metal sphere was surrounded by a solid mass of the torpedo-ships. But many of these were destroyed. More, too, were put out of commission by the copper crystals.

On the arrival of the great fleet from the other camps the tables were turned. The control ships had too low an acceleration, and there were too many ships for the ten-man machines to get, though they tried to make a screen of Dis rays that stopped the ships till they were rayed out of existence. Many of the control ships were lost and many of the ten-man ships.

It was then that Waterson announced two things that gave the Solarians new hope.

It was the fifth of August when the announcement was made. And it was the same day on which nearly the entire fleet from all the camps on Mars started off for Venus, but the movement was detected almost at once, and from great underground bases on Mars the Solarian fleet sent out fifty thousand ten-man ships. These ships skimmed along close to the ground, and their polished metal had been sprayed with a drab paint so that they seemed but shadows that became practically invisible as they sped along, widely separated, but rapidly converging on the site of the Sphere's camp. This had remained on Mars, guarded by so small a number of ships that it was evident they expected the Solarian fleet to go to Venus, as no doubt would have been necessary but for this swift counter raid.

So perfectly camouflaged were the Solarian ships, that they got within ten miles of the camp without being discovered. Then, as their Dis rays flashed out, the entire group of the torpedo ships dove on them. There were nearly one hundred thousand of the ten-man ships, diving down at them in a zigzag course that made them impossible targets, but the fleet had been approaching from all sides, and now the entire Sirian defense was concentrating on the machines attacking from the north. Those from the south crept in behind them, and suddenly the sphere started into the air, then went flying out into space at terrific speed. It barely escaped the Dis rays of the attackers. Only its tremendous acceleration saved it. Now several thousand of the torpedo ships shot after it, the rest falling into the form of a great disc to block the path of the pursuers. Man had long been accustomed to two dimensional maneuvering, but the ease with which these Sirians fell into complex three dimensional formations showed long practice in the art of warfare in space.

That raid was successful in that it forced the immediate return of the Sirian fleet, and very nearly destroyed the sphere. Over seventy-two thousand of the torpedo ships were destroyed, but we lost two thousand ships and twenty thousand men. But Waterson announced that the Sirians would no longer be able to escape because of their greater acceleration. He had discovered a method for using an attractor beam of a short range but considerable power to be used with an electro-magnetic device that would automatically turn on the instruments in such a way that no matter what the accelerations might be, no matter how great, as long as they were within the limits of the ship's strength, the accelerations and centrifugal forces would be instantly neutralized, thus making possible violent maneuvers that the sudden forces had hitherto made impossible. A demonstration of his new ship had confirmed it. He took up a number of the Cabinet in his special machine, and turned hairpin turns at ten miles a second! The acceleration would have been instantaneously deadly had those neutralizers failed. They might as well have been under a half million ton freighter as it landed, as undergo those accelerations! But in that perfectly balanced room, it was not detectable. The ship's hull was made triple strength, as were the power projectors, and the generators. It was powered like a freighter, and could reach its full speed of 1,000 miles per second at an acceleration 5,000 times that of Earth's gravity. Waterson, who weighed two hundred and ten pounds on Earth would have weighed over five tons! It meant that the Solarian fleet would no longer be handicapped by the greater flexibility of the enemy ships. The plants that had been manufacturing the machines had already closed down temporarily, while the dies for these new machines were being made. But within thirty-six hours the first of the machines was being turned out.

And now a great crew of young men were being gathered to man them. They were all volunteers. There were to be one million ships, and that meant ten million men would be needed. Only modern methods could have made that possible, but with three populations, totaling over twenty billions, a sufficient number of volunteers came forward to make the work easy. As fast as these men came to the conscription stations, they were put into the new machines. And here also modern methods had helped. The Waterson system of material energy release had been so successful, that the price of a completed car had dropped to well under one hundred dollars for the small two-man machines. And even for the interplanetary models not more than two thousand dollars needed to be paid, for the raw materials were absolutely free, the labor was mechanically reduced to almost nothing, and as the energy that drove these machines was as cheap as the raw materials, they merely charged enough to make the venture pay a decent return on investment and to pay the wages of the few machine supervisors and the office staff. Men worked five days a week on three-hour shifts in the factories, but longer hours and more pay went to the builders, to the men who had to manually control the building construction machinery, for law forbade the building of offices on the mass production scheme, since that meant an unvaried, monotonous city. But everywhere wages were high, for wages depend, not on the amount of work men do, but on the amount of finished product they can turn out. The men accomplished more, and were paid more, but they worked less. It had taken many years to finally convince the Earth of that, but the example of American labor, with its shorter hours and higher wages was proof enough. And then the influence of the mighty energies Waterson had released made it even more apparent. Mars had already developed the system under the force of the released atomic energies.

High wages and cheap machines had meant that everyone owned one. And so absolutely safe were they that they commanded perfect confidence. This had been a big factor in the making of this mighty fleet. Every-

one knew how to operate the machines, so it was easy to fill the places on the machines with pilots.

Nevertheless, special training was necessary to overcome the caution against quick turns that long experience had instilled in them all. Each accepted applicant was taken up in one of the new machines, and given a breath-taking ride—a ride that consisted in diving toward the Earth with terrific sudden acceleration. Then, just when the student felt certain they would crash and become a mass of molten metal, the ship was brought up, not a mile from the ground, to settle gently; then, when they almost touched the ground, they leapt into the air again with an acceleration that shot them out of the atmosphere with the velocity of a meteor, while the outer wall of tungsto-iridium alloy glowed cherry red. Then came sharp turns at ten or twenty miles a second, till at last the students no longer gripped the arms of their seats in anticipation of a sudden acceleration. Then they were taken down and given a ship to experiment with.

But none of these men had ever handled a weapon of the sort they were to use, so mimic battle practice was held, with the glowing rays of a harmless ionizing beam instead of the deadly Dis rays.

DAILY reports were coming from the Martian scouts as time went on. The Sirians, too, had decided to do some fleet building, for nearly three-quarters of their fleet had been destroyed. The production rate of man's factories, 120,000 a day, had gained a slight lead. It would require ten days before a fleet of a million could leave for Mars with a home guard of two-hundred thousand ships.

The destruction of the Martian plants had lowered the production rate to about 3,500 an hour, but shops put up rapidly on Earth and Venus had quickly brought the production-rate back, and it would be nearer 7,000 an hour by the time the last of the fleet had been finished.

The spinning sphere formation of the Sirians had been almost invulnerable, and an exceedingly destructive formation. The Solarians had chosen several thousand of their crack pilots to practice this maneuver, but despite almost constant practice during the entire ten days, it was a miserable failure as soon as they tried to progress. Standing motionless it was a very effective procedure, but the spinning column was decided on as more effective as long as they had no ship to protect. There were twenty groups that practiced that maneuver.

And then Waterson announced that an associate of his, working in his laboratory, had developed a method for using a triple electrical field to direct the Dis ray, making possible a ray with a range of over sixty miles. This would be absolutely fatal to the spinning sphere system of the Sirians. The Sirians very evidently did not know how to project the Dis ray any further than twenty-five miles. The ability to stand off and hit them would break down the sphere of Dis rays very quickly. There was only one objection. The rays were very powerful, so powerful that they required triple power generators, but the special field of electrical force was the worst problem. The field could not be made sufficiently strong if a single layer of the force was used, but the invention of a method to back up the first with two other layers of equal voltage, thus getting nearly three times the effect without exceeding the capacity of the insulation, had made the new machine possible. This special field was produced by circularly moving cathode rays, or exceedingly high velocity electrons, and therefore could be produced only by atomic methods. This meant ten thousand times the amount of fuel a similarly powered material engine would have required, but material energy of course yields only wave motions of the transient or unstatic type, a type that cannot stand still. Atomic energy can yield static-waves as well as unstatic; the electron can stand still, and is a perfect example of the stationary wave.

These limitations, in turn, meant that a tremendous weight of equipment was needed. And a corresponding great volume of space was required. In the end they had to use specially reinforced freighters to carry the great projectors, each of which could carry but two projectors. Due to their long range, however, the ships were at least self-protecting. There was not time to make and equip more than twenty-eight of these ships before the fleet was scheduled to start. They were completed ahead of time. Some of their trial trips more than fulfilled the best hopes of the inventor. Dr. William Carson, the physicist who developed it insisted that it was really Dr. Waterson's suggestions that made the thing possible.

We had learned something of spatial warfare formations from the Sirians. Now we were to learn a bit of the strategy of spatial warfare.

THE Solarian fleet sailed for Mars on the fifteenth of August, 1961. They were a scant twenty million miles from their goal when a report came from a scout that something was happening down in the Sirian camp. Almost immediately after that the Sirians flooded our entire system with so terrific a barrage of radio frequency static that communication was impossible. They could not transmit from Earth to Venus, and the communication was very poor even from one side of Earth to the other, despite the fact that over a half billion kilowatts were used. So intense was this barrage, that if two of the torpedo ships near the sending apparatus came within twenty or thirty feet of each other, great crashing sparks leapt across, and instantly they were fused. Scouts saw this happen twice.

The Solarian fleet continued on for Mars. They should cover the remaining distance—twenty million miles—in five hours by pressing the ships a little, although higher speeds made the rate of approach of asteroids so great that they frequently could not be detected before they collided with the ships.

Only two and a half hours later a scout came into sight at terrific speed. He must have been doing over two thousand a second, an exceedingly dangerous rate—but his acceleration neutralizer enabled him to slow down safely. He reported that the entire Sirian fleet had risen from Mars, leaving a very few machines behind—this time taking the sphere with them—and had set out for Earth! Earth was on the other side of the Sun—a long two hundred and twenty million miles to go! The Sirians had a lead of three hours. They had as great a speed as the Solarians and would reach Earth before the Solarians. But they would at least be delayed by the two hundred thousand ships—more now, for the steady production would have built the quota up to over six hundred thousand, or a million by the time they could return. The Sirian fleet had been built up to nearly three million though, which could easily crush the fleet of a

million, and the second million later—separately. The trip would take them sixty-two hours. Scouts had been sent ahead to Earth at a dangerously high speed to communicate the news, and the entire fleet had increased its speed to a rate that was considerably higher than safety warranted, but a continuous play of Dis rays was considered sufficient safety at fifteen hundred miles a second. The Sirian fleet had been reported to be making thirteen hundred and fifty, so the Solarians should pass them, or meet them, just shy of the Earth, where the other fleet would be waiting. They should have no difficulty to crush the Invaders with the two million ships.

The radio interference was being maintained by a ship anchored somewhere in space. It was no doubt well protected, and to attack it successfully would have meant the loss of a large number of ships, for the time spent in the attack would delay them irreparably. They must continue to Earth.

There were no scouts from the Sirian fleet—yet there should have been, for over a thousand ships had been following them, far behind. None ever reached Earth to warn the fleet. Every one of them was destroyed. But when the Sirian fleet was well on its way—it turned—and headed *for Venus!* They had purposely let that one scout reach the Solarian fleet with the news that the fleet was headed for Earth—then they redirected their course. The scouts from the Solarian fleet did reach Earth—but soon after the last of the scouts following the Sirian fleet had been destroyed, their radio barrage was lifted. All the ships on Venus were concentrated on Earth, and Venus was left unprotected.

Twenty hours after the fleet had turned back, the radio barrage was again lowered over the System. It was ten hours later that the Sirians reached Venus.

While the radio barrage had been lifted, Waterson had had an idea that there should be some protection for the planet. It did not seem that the planet should be completely stripped of its defenses, and he had suggested that at every city great Dis ray machines of the sixty-mile range type be set up. His suggestion was followed, and at every city on Venus the great machines were installed. There were many of them now, for during the hundred hours the main fleet was in flight the new machines had been put on a quantity production basis. But all the ships that were equipped with them, were sent to the defense of the unattacked Earth! And it was those machines that prevented the landing of the Sirians. They came to the night side of the planet, of course, coming from Mars. It would be thirty hours before they would be expected on Earth—thirty hours before the main fleet would reach the planet—and then there would be the 160,000,000-mile trip to Venus if they were to get there in time to rescue the planet.

But the Sirians could not approach within beaming distance of the cities, and all those that did try to do so, were brought down as a cloud of powdery dust. It was Waterson's caution that saved the billions of people on Venus.

But were they to be saved? The Sirians decided they must destroy the works and the people on Venus, so they made one desperate effort. They had at least sixty hours to work in, and now they had a plan that would require time. They retired some hundred miles from the planet, then the entire fleet, torpedo ships, cargo boats, and the entire body guard of the Sphere lined up, and then switched on powerful attractor beams. Immediately, the combined effect of over three million of these emanations took hold on the planet, and great tides began to rise in its mighty oceans. Many lives were lost in the seaside towns, when the tremendous waves rushed in over the land. But astronomers on the planet and most of the System's scientists were there to watch the Sirians on Mars through their great telescopes. And these astronomers saw what the Sirians intended, and saw that they were well on their way to fulfilling their aim.

A PLANET is balanced in its orbit about its parent sun with the delicacy of a diamond on a jeweler's scales. But, like the diamond, if it be displaced by some force, it reaches a new state of equilibrium. Thus, if the diamond is further lowered in the scale by adding a small weight, it soon reaches a new point of equilibrium. No conceivable force, therefore, could be great enough to displace the planet in its orbit more than a few million miles by pulling it either in toward the sun, or out from it, and as soon as that force was released, it would spring back to its original position as the diamond would regain its balance on removing the disturbing weight. For the sun pulls on a planet with a titanic force; it draws it in with the apparent force gravity, and another similar, but opposite force, centrifugal force of its revolution in its orbit, is constantly tending to throw it into the depths of space. These are the two forces that are always balanced. Suppose the planet is drawn nearer the sun; it revolves in a smaller orbit—and it revolves in that smaller orbit with a higher speed—for it has fallen in toward the sun; it has gained speed as any falling body would. It has gained speed in the direction of the sun, but this has operated to increase its rotational speed. Thus it has gained a greater centrifugal force—you can see the effect with a bit of chalk on the end of a string. The smaller the circle it swings in, the greater the tendency to fly outward. But as long as we continue the force that was added to draw it in, it will remain in equilibrium. Remove this extra force and at once the planet will fall away from the sun, losing speed as it does so, till it has reached a point where it is once more in equilibrium with the force drawing it inward.

Now reverse the problem. Let us draw it away from the sun. Now the orbit is longer, and it has lost speed in moving from the sun. It cannot stay here, it is not in equilibrium, unless the force that drew it out is maintained. To free the planet from the sun, one would have to lift hundreds of quintillions of tons of rock through billions of miles, against the terrific gravity of the sun. It is too much.

Thus we see that as long as the planet revolves in its orbit, it will never fall, and to pull it away from the sun is impossible as long as it revolves in its orbit. But if it slows down in its flight about the sun it at once has less centrifugal force. It automatically falls toward the sun until it has gained velocity enough to establish a new orbit of equilibrium. If this energy, too, is withdrawn; if it is made to stand still in its orbit; it will fall straight to the sun. It is the only way such a thing might be done. And it would take the energies of matter, and strain that to the utmost, to accomplish it.

This was the plan of the Sirians. Three million ships were dragging like a Titanic brake on the planet as it

wheeled in its orbit, and slowly, steadily it was falling into the blazing furnace of the sun. Their ships were not designed for this task, but they could do it in the sixty hours at their disposal. In a short time it would be falling directly toward the sun, but it would take many hours for the seventy-million-mile fall. Even if it were stopped before it reached the sun, any place within twenty million miles would be unbearable.

It was the distressed planet itself that warned the people on Earth and the men of the fleet that the Sirians would never reach Earth, for the radio was still dead. But the fleet turned for Venus at once. They were far to one side of the path to Venus, and they would have to turn, but it would take them thirty, instead of sixty hours to reach Venus. And the other fleet was coming from Earth. They were not quite a million strong, but those machines that had been produced on Venus would come also, and that would bring the total numbers up to over a million, and with the main fleet the number would be well over two million. There were also three hundred of the long range Dis ray ships now, for many more had been produced and Venus would supply an equal number.

WE can only admire the wise action of the Commandant of the Venerean fleet, Mals Hotark, in not sending his pitiful fleet of a few thousand out to fight with the Sirians. The members wanted to, the people of Venus wanted him to, but he wisely waited until he saw the fleets of the System approaching. It would have done no good, and lost many lives, and valuable ships to have gone in advance to the attack.

Many people tried to leave Venus, but enough machines were freed of the task of stopping the orbital motion of the planet to patrol the heavens and keep the people from leaving. They beamed thousands of private cars out of existence; it seemed unnecessarily cruel.

The two great fleets were drawing nearer to the planet, converging, and at last they got so close that they could carry on a radio communication by using the terrific power of over two billion kilowatts of energy. The amount of power that Sirian machine was throwing off has been estimated at a minimum of fifty billion kilowatts. We know that enough power could be picked up from a hundred meter aerial on Earth to operate a small, high frequency motor.

When radio communication was established, they agreed to wait until they could join, for the fleet from Earth was two hours ahead of the main fleet. The loss of time was made up for in greater efficiency of action. They would need it all. At last they joined fleets, one mighty disc of two million airships, they flew on through space at a steady rate of five and three-quarter million miles an hour. They arranged themselves in a mighty cone as they came nearer Venus. Already the machines had slowed it down so greatly that the planet was over a million miles out of her orbit, and rapidly adding to this mileage.

But now as the great cone approached, the great ships with the long range Dis rays leading, they were discovered. The cone formation was chosen, for that is the three dimensional equivalent of the two dimensional V that man had used in war on earth for thousands of years.

Now began the greatest battle in the history of the System. Here were two mighty forces slashing at each other with terrific disintegration rays, fighting in the great Void, and five million powerful ships darting around, slashing, stabbing with a death that struck with the quickness of light.

As the great cone of the main fleet attacked from one side, there was a smaller cone attacking the Sirians from the other, but long before the Sirians could bring their rays into effect the long range rays had torn great holes in their ranks. The Sphere had retired with its escort at once, going swiftly to Mars. The main fleet was too busily engaged in fighting the Sirians' main fleet to worry about the Sphere at present.

A dozen times the great spinning sphere formation was tried by the Sirians, but each time a withering blast of the long range Dis ray cut it up as a tool held against a spinning block of wood cuts it down in the lathe. Their strongest formation was useless, and they could no longer outmaneuver the Solarians, the new ships could turn and dart as quickly as they, or even more quickly. The big Dis ray ships were not equipped for fast fighting, so when there were none of the spinning sphere formations to break up, they retired to a safe distance, and waited for any ships that might attack them. Few did. It proved suicidal. But steadily the forces of man were conquering. In a hell of flashing Dis rays, the new ships were proving their worth. The flaming rays had seared the land below for many miles, but the fleet of the Sirians was fast going. The new fast ships of man could dodge the rays of the Sirians, turn and dart on the tail of their attacker, then hang there, the attractor beam giving them an added grip until they could flash the machine into nothingness with the Dis ray. They turned, ducked, darted ahead with terrific speed, suddenly stopped, and then were going full speed again. And another Sirian ship was gone. Now it was the delicate apparatus of the Sirians' ships that suffered; they could not keep up with the sudden turns of this flexible adversary. And their great fleet had been reduced to a scant quarter million, but we had lost nearly a half million ships, five million men, in that Titanic struggle. Such a battle could not last long. It was impossible. Nothing could stand before the Dis rays, and with those turning, darting ships, sooner or or later every ship must come under the influence of those rays. But now the last of the torpedo-ships were fleeing into space. But we did not care to have to fight them again—and they too were rayed out of being. They could no longer dart away from us before we could catch them—that was for us now!

But now the fleet returned to a greater task. Venus had been falling toward the sun, and was nearly a million and a quarter miles off and within her orbit. Now a great fleet of cargo carriers from Mars, Venus and Earth came up, and with them came wrecker ships, capable of picking up on their powerful attractor beams an entire million-ton passenger-freight liner—great liners themselves, all equipped with attractor beams. Soon they were all using their power to bring the planet back to its normal speed. It did not take the ships of that mighty fleet, many specially designed for heavy listing and towing, many designed for tremendous loads, very long to bring the planet back to its age-old orbit.

In former days we would have found a world wrecked by panic. But this later generation had learned to trust in the powers of the ships they had, and there had been little of the terrible panic that would have affected the

world of a generation ago. Then, too, they knew that with the demonstrated power of the long range Dis rays, they could safely convoy a fleet of the great passenger liners to safety.

What helped also was the fact that the human mind cannot grasp the full significance of the fall into the sun. If you were told that the planet you were on was sinking toward the sun, you would be surprised, horrified, and would probably try to make a bargain-buy on real estate, while the other man sold his to get his money out. You would simply fail to comprehend the magnitude of the catastrophe. It has never happened, and never will, the mind says, and we unconsciously believe it. Your neighbor would joke about it to you. Of course many would leave, but most people would stay till the actual physical heat of the sun drove them off. We are constituted that way.

But now the radio barrier was down, and news from the Martian scouts made men hesitate. The remaining cargo ships had settled on Mars and were even now pouring out their strange crews. But they were not building cargo ships. Every one of the worker machines were kept in action constructing duplicates of themselves as rapidly as possible. Already a great number of them had been made—over seven hundred of the machines it was estimated—and now these were engaged in similar work. The number grew in a steady geometrical series.

But the scouts were driven away by the torpedo ships. Then there was no news of the operations until nightfall permitted the scouts to creep up and install the usual floating vision machines.

Then at last we understood the reason for this tremendous number of inoffensive worker machines. There was a great seething mass of metal around the workings now. Great blazing lights illuminated the scene as brightly as day. There was a great horde of shining metal machines working swiftly about the great plain. There seemed to be thousands of them now, and they were all busily at work on great machines—the torpedo-ship machines! There must have been nearly a thousand already completed and already the fleet that had escaped had been built up to many thousands by the rapidly working machines, and a steady stream of long glistening shapes rose—only to be lost in the darkness beyond. Steadily the great machines were being put together, and steadily the great fleet was being augmented.

Before morning that fleet had reached two hundred thousand, and was now growing at the rate of twenty-five thousand an hour. Steadily this rate was increasing. The fleet was too large to be attacked by man's weakened fleet, for the delay in putting Venus back in its orbit had given the Sirians a chance to build up an invulnerable fleet. The added time of the trip to Mars meant a still greater fleet. Already their production rate was far greater than Man's. Man could not hope to compete successfully. We were learning the meaning of quantity production.

Had it been possible to attack them with the long range Dis rays it would have been tried, but the plan was hopeless. Before the fleet could reach them there would be 100,000,000 miles to go to reach them, and it would take approximately twenty hours, in which time, at the present rate of increase, the Sirian fleet would have reached a total of three million again. They would all concentrate their attack on the long range Dis ray ships. No Solarian ships could help without interfering with the action of the Dis ray ships, and they would need help, for each ship carried only two beams. More could not be carried. They would merely be held at bay, unable to attack their goal, useful only in breaking up the spinning sphere formation, but that could be prevented. The Solarians had learned that trick from the Sirians. The Sirians had succeeded in breaking up every spinning column formation by simply getting into the midst of it before it was formed completely. It required perfect coordination of several machines to do it, but it was always done. The long range Dis rays were excellent now in defending a city, but useless for attack because of the terrific weight of the apparatus. They could not attack the Sirian fleet. If they did the production machines would have been so built up by the time they reached the planet that any ordinary rate of destruction would be easily equaled by the production! Within three days it was decided that the Sirian fleet would be built up enough to attack. They would then attack our planets, no doubt.

A CABINET meeting was called at the Waterson laboratories on Earth. There Waterson first demonstrated the weapon that finally conquered in the terrific struggle. Before the members, on the Cabinet table, was a small portable material energy disintegrator, a machine that gave off its energy as light. There was a second machine at the other end of the table, a machine that occupied about two cubic feet of space, and on one side of it was a small switch and a dial; on the other was a familiar looking projector.

Dr. Waterson spoke:

"Gentlemen of the Cabinet: I have here a new machine that my laboratory has developed. I will demonstrate its action first." The light was switched on, throwing a brilliant shaft of light against the ceiling. Then Waterson snapped on the switch of the new machine, and there appeared a strange beam of blueish, ionized air. But unlike any other known ionizing beam, it was shot through with streamers of red fire, long, hair-thin streamers that wavered and flickered in the blue tube of the ionized air. It reached out, touched the light generator, and passed on, through a series of plates of different materials. But the instant that strange beam struck the light-machine, it went out. Then a moment later, when the new machine was turned off, the light snapped back on.

"Gentlemen, this machine will produce a field, directional in this case, that will so modify the properties of space as to make it utterly impossible to disintegrate matter into energy. There is some tendency to fix energy as matter. I think that will be interesting to us in the event that this war is successfully concluded. But at present we are interested in the properties of the beam in that it will stop the disintegration of matter. The process depends on the modification of the properties of space. It is well known that in ordinary space, such as we know, there are twenty coefficients of curvature. In ordinary empty space, ten of these have zero values, and the ten principal coefficients have certain non-zero values. This machine so affects space that it makes all the coefficients of space have non-zero values, and fixes these values to suit its own purposes. The results are amazing. I have done some things with this machine that makes me truly afraid. But we are interested in it because certain of the values we can assign operate to

force space to take such curvatures, that any change of the condition of matter to condition of energy is impossible. On release of the ray, the space returns to its normal curvature.

"Working out the theory of this machine has been a tremendous task. Even the great calculating machine, the new integraph developed last year, and it is a far cry from that first one that M. I. T. developed in 1927, required many weeks of work to solve the problem in twenty coefficients of space. In so doing at one stage we had to assume a space of twenty dimensions in order that the correct values in the four true dimensions might be determined.

"But there is still a great deal of work to be done. We must develop practical machines of a range of many miles. There is no difficulty in using the ray, since, as it is a condition of space, not a vibration, it is impossible to stop it by any shield. There is only one way to work with it, to create it directionally. We make the field by projecting certain strains along a beam, then once started the field follows that line to a distance dependent on the strength of the generator.

"But this will require at least five days to get into working form. I suggest that in the meantime Venus makes several million of the long range Dis ray projectors, and distribute them all over the planet, to be turned on from a central station, or by their own separate crews. I have no doubt that the Sirians will attack that planet before we are ready to attack them. Earth, too, must be prepared. But in the meantime we can begin the work on the new de-activating field projectors, as I call them."

Waterson was right. It was three days later that the Sirian fleet left for Venus with a number of torpedo ships so tremendous, it is absolutely inconceivable. There were over two hundred million of the ten-man machines! When they started to settle about Venus, the sky was so filled with them that it was literally dark for many miles. They attacked at Horacoles the System Capital, but the fields of the great Dis rays were too much for them. Neither bombs nor Dis rays could reach through. The air was dense, and filled with artificial smoke to prevent the transmission of heat rays and great winds were created for the purpose of carrying the heat away; but this was done automatically by the expanding air before long. They could not attack the city. All over the face of the planet were the great Dis ray emplacements. Great ships hung even over the great rolling oceans, sending the blue rays of ionized air up like some column that was to hold the Sirians from the Planet. And they did.

But now again they began to slow down the planet—not gently as they had had to before—but rapidly. The planet would have been pulled to pieces, except that the very attractor beams that were pulling on it tended to relieve the stress. But the cargo ships of Venus were pulling to keep the planet in motion. It was a strange thing to contemplate! Two mighty forces, one a fleet of two hundred million small ships, the other a force of as many thousand huge freight carriers, having a tug-o-war for a planet! But the odds were too great. Slowly the Sirians won. The planet was steadily dropping toward the sun. Now it seemed no fleet could come to aid them, and the Sirian fleet was being augmented constantly by a steady stream of ships from Mars. It was the sixth day after the announcement was made that Waterson had a fleet ready to attack the Sirians. The Venerians also had a fleet ready, prepared by the directions of Waterson's engineers sent by radio-television and radiophone. They were ready to attack, and the Terrestrian fleet arrived at Venus just six days after the announcement of the new weapon.

The practical projector of this new ray had been quite heavy, and they had been mounted in groups of twenty projectors on special hundred-man ships, using the same acceleration neutralizer used on the ten-man ships. They were arranged to throw a wide beam, so wide that the new ships with twenty, could prevent any action in a field of over two hundred miles depth, and in a cone with a base of six hundred miles diameter. The ships they had could approach within a hundred miles of the Sirian fleet, without being seen, for they were painted black therefore and showed no lights. In the darkness of the void they were easily hidden.

THE entire expedition went as planned. The radio barrage had not been turned on, and they were in constant communication with the Venerians. The two fleets were to attack simultaneously, over different areas, so that between them they could wipe out so large a number of the enemy ships that the fleet of two million could easily handle the task.

Hidden in the utter dark of the void they crept up on the Sirians. They were in the sunlight, but the black coating kept them invisible, while the Sirian ships shone brilliantly. Then at last the tip of the great cone formation was within easy striking distance of the fleet. There reached out the strange ray, and here in space it was utterly invisible. But suddenly the ships within its range began to waver, to fall together under mutual gravitation. With one swoop they all shot toward the ships in space that had paralyzed them, for the attractor beams had been turned on them. As the great mass of ships fell rapidly toward them, long range Dis rays reached out, and they melted into clouds of shimmering dust. Great swaths were cut through their ranks. A similar scene was taking place far to the left of the Terrestrian fleet where the Venerian fleet was working havoc among the invaders. Now the last of the ships had been rayed into nothingness and a great fleet of the Sirians were rushing forward to attack for the ships invisible on account of their black line had been electrostatically located now. But as the Sirians came within one hundred miles of the other fleets, the ships all ceased to accelerate, to change direction; they just drifted straight into that cone of Dis rays. All walls of the de-activating field were lined with the ten-man ships, their shorter range Dis rays prevented any Sirians from escaping. Bright lights shone out on the Solarian fleet now—they wanted the Sirians to attack. The original cone formation had shifted rapidly; now it was a double cone; then it changed to a quadruple cone. There were six hundred of the de-activator ships and these were arranged so that they shot their rays off in four directions, making four cones of de-activated space, with the fleet of de-activator ships at the apex. Thus they were protected on all sides, and quickly, as the Sirian fleet spread out, more ships rose and there were six cones branching out. In the center rested the main mass of the fleet, the long range Dis ships, their attractors pointing out into the cones to draw the disabled ships of the Sirians into the range of their Dis rays, emanating in thousands from the

ships lining the sides of the de-activated cones of space. The fleet was invulnerable and so sudden and complete was the failure of their power in these de-activated regions, that they did not seem to have time to warn their fellows. Many millions of the ships were lost before the wild charge could be checked; then the six-cone formation entire began to move slowly around; the Sirians, waiting to see what was to happen, were caught before they were aware that they were in danger. Many, too, were caught by the powerful attractor beams of the heavy ships within—drawn in by the greater power of the heavy ship, till their power failed. But at last the Sirians had learned the effective range of this new power and tried hard to avoid it. The six-cone formation was immediately broken up, and the six hundred de-activators went out individually, each followed by a swarm of the ten-man ships to disintegrate the ships caught in the de-activating cones. The Terrestrian ships were marked by a blazing blue light, so that if they too were caught in the de-activating field, they were not disintegrated. Only those around them were, and they were then released, as the ray did not seem to have any injurious effects on man, except to give him strange dreams. In some way the brain was stimulated by the ray, as long as the ray was used.

The de-activator ships were completely self-protecting; they could stop any number of attackers from any direction, provided the paralyzed ships were disintegrated as soon as caught, for if too many were piled up, the tendency of the matter to disintegrate in the engines, plus the natural tendency of the space to resume the normal curvature, caused the ray to become ineffective as it was overpowered, and one ship was lost in this way. Too many ships piled up, and only part of them could be rayed out by the ship itself, and there were not a sufficient number of helping ten-man ships. But the mighty fleet of the Sirians was already beaten. They still outnumbered us ten to one, but they could not fight this new force. They began a running fight to Mars, and now the Solarians were united. Rapidly they wiped out the edges of the fleet, and gradually worked in toward the center. But the Sirians could not fight back—they could use only the explosive shells, and few of them reached their goal. They were disintegrated, or missed. Not more than three thousand men were lost in that entire engagement.

But now the Solarians tried a plan to capture the Sphere. A large number of the ten-man ships dropped out of the main fleet, but not enough to make it noticeable to the hard-pressed Sirians. These were joined by one hundred of the de-activator ships. Then these, all capable of higher speeds than the main fleet, set out at the highest speed that could safely be maintained, and darted toward Mars. Undetected they rushed past the Sirian fleet and passed on toward Mars. They reached the planet fully three hours ahead of the main fleet. By the time the main fleet had arrived, it came unattended, for the last of the mighty fleet of two hundred million torpedo-ships had been turned to impalpable dust, floating in space.

The advance guard arrived without warning, and as they had expected, found the Sphere resting on the ground, protected by a great fleet of the torpedo-ships. There were nearly a million ships there, with the great machines rapidly making more. However, all were grouped in an area that could be covered by the cone of the de-activating beam. And out in space, the ship commanders decided on a plan. Fifty of the de-activator fleet took positions high above the Sirians, and the rest went with the entire fleet of the ten-man ships. These were to approach the camp from the ground. Lying close to the ground, they would be hard to see in the disappearing light. At a fixed moment, all the ships above were to turn on their de-activator rays, which would be plainly visible in the Martian atmosphere, while the ground fleet of fifty de-activators were to use their rays from the side. The ten-man ships were to form a circle around the camp at a safe distance from the de-activator rays, for they would crash when their power failed, if they were caught by the de-activator rays. But they wanted to capture the sphere in good condition, so they arranged to have the space directly above it unaffected by the de-activator field, lest some torpedo fall on it and destroy it. This would leave an exit for the torpedo ships, except that at a point a mile or so above the Sphere, a cross-ray made escape impossible.

The rays were turned on. Instantly the fleet of nearly a million torpedo-ships fell wildly out of control, down through the blue glowing air, in which great streamers of glowing red seemed to waver and twist. Just outside the curtain of destruction waited the entire Solarian fleet. Slowly they closed in till their Dis rays swept all the ships within sixty miles of the edge out of existence; then rapidly the de-activator beams were forced ever sharper and sharper, till at last only the Sphere and a few hundred of the torpedo-ships, several hundred of the torpedo-ship constructors, and the corresponding cargo ships and worker machines were left. These had been saved for investigation by the scientists, for they were helpless.

But the war was over now. The Sirians had been destroyed, or reduced to mere museum pieces. Now the Scientists came to investigate the Sphere. There was much we wanted to learn from the creatures of the Sphere. But it was a strange story that the Sirian sphere had to tell.

AEONS ago there lived on a great planet of Sirius a race of intelligent men, shaped as we are, but smaller due to the greater gravity of their planet. And these men had developed a high civilization, a civilization different from ours, in that they learned early about mechanics, but chemistry and physics merely developed from the needs of the great mechanical engineers. Electricity was used as a powerful aid in their machines, and in their processes; it was a by-product, not an end.

Gradually their machines eliminated more and more of their work; they became more and more complicated, but more and more trustworthy. Men began to experiment with physics and found that their calculating machines needed development. It was easy to add first one step, then the next. More and more the machines could do. The mathematics became more and more complicated, and the machines developed the equations, found they could not handle them and passed them out as unfinished results. Finally one man used the machines to calculate the design of a machine that would be able to do these new equations. He built it, but the calculations were wrong. The machine had correctly solved his problem, but he had stated it wrong. It resulted in a machine that would solve only simple problems, but it

did something no other machine had ever done. Given irrelevant data it would choose the correct facts and solve the problem. It was a step, a short step toward a machine that really thought.

Progress thereafter was rapid. The machines built machines, had been doing it for decades in fact, but now they did one thing more—they designed them. Now the problem could describe the type of machine needed, and the worker machine would design it, and turn out the completed machine! But these machines were rapidly perfecting the beginning that man had made. Within a decade after that first discovery of the principles of mechanical thought the machine was made that could not only solve problems, but could also originate them. They had developed a brain. It was a great machine, which occupied an entire building, with its massive framework bolted down to the ground.

Man began a rapid decline, for the machines did all his work. With the construction of a machine that could originate a problem, man made a mistake. He had created a machine that was more powerful than he, except that it was immobile. And this machine originated a new machine, a machine that would release the energy of matter! It had developed this because it had been able to see that such energy existed. Man's machines could have solved it long ago, but the problem had never been stated. Now came a machine that could state its own problems—and solve them.

And with this new energy it designed a new brain machine. A brain machine such as no man's brain could conceive—a machine that could move! For it was powered by the energy of matter, and could move as no other machine had ever moved before—out into space!

Still the machines worked for the Sirian man, and he learned of the new discovery, and began to design a new brain machine.

Some of the Sirians realized the danger that was facing them; and they had continued long researches on man's brain, and at last had discovered the secret of giving a machine that emotion we call devotion, loyalty, or gratitude. And they built a great machine on that principle and used material energy to power it. It was a success. It could think original thoughts. It pointed out the danger of the existing machines — they were stronger than man. It was only man's mobility and ability to control all mobile machines that had made him superior, for a brain without a tool, or body is helpless. And now that was lost. The existing brain-machines should be destroyed, and new ones built, using the principles that it was designed on.

But the mischief was done. The new brain-machine, designed by a machine, had done it. A machine had been built that was controlled by thoughts, a machine that could be controlled by the machines. Each of these machines was given a small brain, equipped with televisor sight and hearing, and it was powered by material energy. They could run for years without outside care, for the thinking machinery they had was sufficient to keep them oiled, and to make them seek repairs when they were damaged. They were susceptible to thought forces, and did as the thought waves suggested and reported to the control brain exactly what was going on about it.

And now this new brain developed a space-flyer to carry these machines, and man could not help knowing, for its every thought was recorded, for man's use. Then one day this record was found destroyed. The next day the brain machine had left the planet, and taken with it the new space-flyer and the new telepathically controlled machines.

To the outermost planet of the System of Sirius the great machine fled. For years it remained there waiting, thinking. Then at last it called its worker machines into action. A new machine grew up from the stores of metal that the space ship had brought with it, at last the metal was used up, and the machine was not completed, so the space-flyer was sacrificed for the completion of the machine. The new machine was started. From its lip-like spout there poured a steady smooth stream of molten metal, and the rock on which it rested was eaten away. The first transmuting metal producer was made.

Decades passed, and only a small percentage of man developed. The rest sank deeper and deeper into a life of ease. The planets were all explored by the hardy ones, and no trace of the brain-machine was ever found, for it had discovered the Dis ray, and sunk deep into the ground, hollowing a great cave to live and work in.

BUT back on that planet, the scientists had developed machines that surpassed it in power, and finally one of these picked up a thought message from that distant machine that told its story. It was a thought that had not been consciously radiated, only the marvelous sensitivity of this new machine could have detected it, but now the men knew. It was too late to do much to prevent it, for they had no weapons. But the machine did. It was preparing to drive man from the planets, to rule there in his stead, with a population of machines!

The scientists quickly built a great space-flyer, a gigantic machine of over ten miles diameter, a huge sphere. And in that they established laboratories, workshops, machines, and living quarters. They took with them the finest men and women of their race, and sailed out into space, taking an orbit about the sun of Sirius. They were comfortable there in an equitable temperature, their ship lighted by the sun on one side, and dark on the other, steadily revolving on its axis like a miniature world. The foods of the people were chemically prepared, for the brain-machines had taught them how. The air was repurified constantly by machines that regulated the percentage of the gases to the thousandth of one per cent. But the entire ship was painted black. It could not be discovered floating there in space, so tiny in the vastness of a system!

It was two weeks after they sailed that the machine-brain attacked. It sailed out of its hiding place with thousands of great ships, armed with Dis rays and with explosives, with heat rays and attractor beams. The population of those worlds was wiped out in a week, and the rule of the Metal Horde began.

The original brain built other brain machines to direct its affairs on other planets, and to do the work it did not wish to do itself.

For nearly a century those men lived in space, making swift forays on a planet with a fleet of cargo ships, that revolved about the main ship like satellites when they were not being used. In these trips they would bring back tons of rock, and leave most of it stored in the ships, dumping them into the reservoir of the parent ship when it was needed.

Then a swift ship was developed. A ship that could

start and stop more quickly than any made before—a ship with acceleration neutralizers. But the machine brains of the Metal Horde never learned the secret. With a small fleet of these, the men drove an attack at the unprotected main brain machine. There were no men known to live in the system. No other known machine could move without the knowledge of that main machine, but these could. They too had the Dis ray now, and they destroyed the main brain machine. They were lost in the ensuing fight, but that machine was destroyed.

All the remaining machines were equally powerful. Any one of them could have built a brain machine that could easily conquer the others—but it too would have to bow to its creator. They fought it out. The men had known this would be the result.

It was a war such as the system had never before seen. Each force was equal, and could not ally itself with any other, for the machines could not lie or state other than their thoughts, and each wanted supreme power. They developed new weapons, weapons whose strength lay in their number. One by one the machine brains had gone down to defeat, the men of that ship helping to disturb the balance of forces by ever so little, yet always enough to throw one side down to defeat, yet always remaining in hiding. At last there remained but one machine-brain, and its weakened force necessitated its return to the devastated planet. With the destruction of the other brain machines, the remaining machines that they had previously controlled, automatically obeyed the new master as perfectly as they did the old.

They returned to find a new fleet awaiting them. But it was not a vast fleet such as they had encountered before. At once the torpedo-ship machines settled to the ground and began turning out their weapons. But it was all over before they could enter as an important factor. These ships had a new weapon. It was a ball of glowing blue light that was driven along a beam of some vibration, and as it touched any ship, the ship instantly volatized so suddenly as to constitute an explosion. The balls of light lasted about a minute and a half each, but were replaced as quickly as they were used. When they were finally used, they would die down to a dull red glow, then suddenly wink out. They could be swept from one ship to another, taking toll of ten or twelve ships each, and the beam that guided them could drive them with the speed of light and supply an infinite acceleration. They were glowing balls of concentrated energy of some sort, and as such could travel with the speed of light.

But they were effective to the *nth* degree. The entire fleet of that one remaining brain machine would have been lost, but it retired into space, racing away at top speed, out into space, with the remaining remnant of its great fleet.

And sixteen hundred years it had raced across space, to be destroyed at last by another race of men. The battle was over, and the machine awaited its destruction.

We rayed it out of existence. It was too great a menace to keep.

Some people still do not believe that those Sirians were truly machines. They can not believe that a machine can have intelligence, but certainly Waterson's calculating machine has intelligence of a sort. And they ask, what would a machine want to exist for? It would have no aim, nothing to perform. Why should it want to live, or exist?

We might ask what it is human beings want to live for. If there is an after-life, it is certainly not that that we live for. I am sure no man wants to die. Yet what aim have we? What function must we perform? Why should we wish to live? Our life is a constant struggle, the machines, at least, had eliminated that. There seems to me no reason why a machine should want to live, but certainly it has less reason to pass out of existence than we have!

That war was destructive—terribly so. But it has brought its compensations. More than fifteen million human beings lost their lives in that great struggle, either in the battles in space, or caught in the Dis rays during that battle on Venus.

But those fifteen millions have died a painless death, and twenty billions live because of their sacrifice. And it was not a vain sacrifice. We have learned much in return. No machines man ever made equaled the machines we captured there on Mars. And man will never experiment on the lines of the machine-brain. He has been warned. The brain-machine we captured was destroyed without investigation. The machines we use, the wonderful worker machines, have been modified to permit of radio control.

And Stephen Waterson's discovery of the de-activating field not only helps in law enforcement, but makes war with material energy impossible. No, in all, we have lost little.

Mars lost its cities, its forests, its ancient civilization. New cities are being built on the modern plan, larger, finer, more beautiful; the forests are being replaced; but the records, the relics of a civilization have been lost forever. In that we have lost much. Though all moveable things were moved when the warning came, there was much that could not be moved. The great palace of Horlak San was destroyed, but it is being rebuilt in the exact spot, in exactly the same manner. It is a worth-while project, but there is much which cannot be restored.

It will be eleven more years before we will know whether we can ever communicate with the Sirian men. The speed of light is too low for rapid communication, and as the first signals were sent out in September, 1961, and it is now September, 1968, the signals are not due to reach Sirius for two years more. Then it will be 1979 before we can hope to receive their reply. I often wonder if they will ever get those signals. I can remember distinctly the recoil of the great projector as the mighty surges of light flashed out across the universe. It seemed like some great gun—the back pressure of the light was so great. And what will those replies tell us? It is interesting to speculate on that subject.

THE END

Remote Control

By Walter Kateley

Author of "The Fourteenth Earth," "Steam Heat," etc.

Illustrated by
WESSO

THE empire of the ants is generally and universally conceded to be the most perfect functioning organization known. What makes it possible for them to carry on their work without any apparent leadership or supervision? Mr. Kateley develops an original idea in a very ingenious manner—namely, the control of intellects of animals and insects from a center of dissemination. Basing our assumptions on present-day findings, we can hardly say that the conception of "Remote Control" is impossible. We recommend this as an exceedingly interesting story, well worth your careful reading.

A MASSIVE steel basket, much resembling a greatly enlarged freight container of a gondola railway car, pulled up beside the dock. It halted directly before where my friend, Mr. Kingston, and I were standing. Instinctively I looked for a tow line, supposing that the load was carried by a barge, which on account of its great burden was submerged. I could see no tow line, and no tug was in sight. My companion saw my bewilderment.

"You will be interested in our new method of transportation," he said, leading the way to the edge of the wharf.

I peered over into the water. What was my surprise when, instead of a submerged barge I saw a great blue whale.

"Is he real?" I asked with a gasp of astonishment.

"Real? Of course he is real," said my friend, with a quiet laugh. "What is the good of knowing the great secrets of Nature if we can't make use of them?

"These whales and the sharks," he went on, "are carrying the better part of our heavy stuff; the cement and the building stone, for instance. Without them we would be in a frightful mess of congestion. We should have the whole channel full of freight boats, tugs and barges. There wouldn't be room for the craft to get around. These servants of ours need only room enough to slide through. They handle more material in one day than a whole harbor full of boats could handle in a week. Besides, it costs money to buy or build boats and barges. And this old sulphur-bottom is nearly ninety feet long; and we have sharks that are about fifty feet.

"The unloaders are coming now. I shall have the pleasure of showing you some real efficiency."

At that moment there issued from one of the avenues between the great piles of materials the most motley gang of dock wallopers that it had ever been my privilege to see.

First came some half dozen lively little apes, closely followed by as many huge and fearsome visaged African gorillas. These gorillas were flanked by two powerful lumbering elephants.

Without a moment's hesitation the monkeys swarmed agilely over the newly arrived cargo, and with movements of incredible swiftness untied and rolled up the tarpaulins that covered the freight. It proved to be a cargo of sacks of cement.

By now the more powerful but less agile gorillas were on the load. They picked up the huge bundles of tarred canvas and tossed them easily to the dock. Then they laid down net slings, and began filling them with bags of cement; picking up and tossing the hundred pound sacks as easily as a man would so many bricks.

"One of them is as strong as ten or a dozen men," remarked Kingston as the first sling was filled. "Now watch the big boys do their stuff. Give them your careful attention."

The two elephants stepped to the edge of the dock, and extending their trunks, passed them through the loops at the ends of the slings, which were held in readiness by a couple of the little monkeys.

They swung it aloft, dumped the sacks on the platform with a heavy thud, and returned the empty sling with a swiftness and precision that was astonishing.

Almost before I had time to realize what was going on, the first load of perhaps a hundred tons was unloaded, and another load was pulled in; the great whale sliding swiftly away and giving place to another nearly as large.

I stood looking at the whole performance, overcome with amazement.

"I can't believe it," I said at length. "There just ain't no such thing!"

"Go to the ant, thou sluggard. Consider his ways and be wise," quoted Kingston.

At that moment something under water a little way out from the docks caught my eye. Soon I was able to make out a long procession of whales and giant sharks. Although they were quite submerged, I was able to see that each was carrying a large container on his back loaded with stone. Some had but a single block, while other loads were made up of smaller pieces.

"Undoubtedly that is the brain and nerve center of the whole colony," declared Kingston.

"We are using these rocks for masonry coffer dams," said Kingston. "You see, we are sinking several shafts, in order to build the tunnel in sections. In this way we are able to employ more of the large excavating machines; and it is much easier to dispose of the débris out in the Channel than it would be if it were all brought up at the two coastlines.

"You see, we are very fortunately located here for the securing of building materials. The Cornish coast, just up the Channel, affords an inexhaustible supply of the best granite rock; and the cement works, just over yonder at Portland, furnish the best grade of cement right at tidewater. The stone can be transported under water with a minimum of effort; for its weight when submerged is considerably reduced.

"Then again, these carriers can place a rock in a submerged position, exactly where it is wanted, without the work of an additional handling. The method is proving both swift and economical."

I [illegible] but all this had me floundering beyond my depth. Midway between incredulity and amazed curiosity, I managed to ask:

"But—but where are the bosses for the monkeys and the supervisors for the whales?"

"Oh, we have established offices in London," he explained. "This is all carried on through a system of television, and of remote control.

"You see, there were no buildings in Dover or anywhere along the English Channel large enough to house our office force and necessary equipment.

"You must know that this England-to-France tube is by far the largest engineering feat ever undertaken. It requires very many clerical and other workers.

"The only people we have here are the material checkers. They take care of receiving and reshipping such stuff as you see here on the wharf. Come, I will show you one of their booths."

So saying, he led me to a little glassed-in office. Here we found two men seated at desks, but apparently idle, but in reality their attention was fixed on a number of typing and computating machines on the opposite side of the room.

The machines were being operated at lightning speed, not by lady typists, as one might expect, but by bushy-tailed gray squirrels!

"Did you ever see a squirrel operating a revolving wheel in a cage?" asked Kingston. "Well, that's where I got my idea that they would make good stenographers. I believe they can move at least twenty times more quickly than a human being."

I could readily believe that such was the case; for one of the little creatures was mounted on the keyboard of a comptometer, operating the keys with all four feet. He was working with a frenzy of almost imperceptibly quick movements, so that one could scarcely believe there was any intelligent system to his performance.

Another was operating a quivering typewriter with equal swiftness.

"Do you mean to tell me that these squirrels know what keys they are stepping on?" I asked.

"Well, no; they don't exactly know what they are doing, any more than your hands know what they are doing when they comb your hair. Their little minds—such as they are—are crowded aside by the will of the director.

"This state of efficiency, however, is arrived at only after a great deal of practice. The director must educate the muscles of his squirrel, just as a human operator must educate the muscles of his hands.

"I don't suppose they will ever know that they are doing their part in building a thousand-foot tunnel, nearly twenty miles long. And they may see you, but they will probably never know that you are the discoverer of the great principle that has rendered all this possible." And he slapped me affectionately on the back.

"What I have done is nothing compared with what you are accomplishing," I replied.

"And even that little was only an accident," I continued reminiscently.

And indeed such was the case.

What he had in mind had all happened some four years before.

I had been employed for a number of years—in fact I still am—in the Patent Office in Washington.

I had known Kingston more or less intimately for some time. In fact I had accompanied him only the year before on a most extraordinary expedition—an expedition that had led to some extremely interesting and important discoveries.

At that time he was an amateur scientist; employed as a designer of excavating machinery in a large manufacturing plant. To say he was an amateur in science is probably doing him something of an injustice; for I fully believe that even then he had a deeper insight into the physical properties of all matter than any other man I have ever been privileged to meet.

He had already perfected some experiments pertaining to atomic densities, that were destined to have almost revolutionary effects in the realm of physics.

His was a personality such as made one instinctively feel that he was in the presence of a great mind; and in addition I had found him to be a most companionable and genial spirit.

I HAVE long been something of an amateur scientist myself; not that I have any great store of scientific knowledge, or have ever accomplished much of a scientific nature; but I have always been keenly interested in the unseen forces that rule the everyday world. In fact, my interest in scientific matters has always far outrun my ability to investigate.

I have a month's vacation every year, and I usually spend the major portion of it rusticating on the old farm in Minnesota where I was born. Here I have quiet and leisure for studying any phenomenon of Nature that for the moment has enlisted my attention. For a few weeks I am a geologist, a zoologist, or perhaps an entomologist; browsing among the secrets of nature.

The old homestead has a small creek with a good fish pond. The pond and the riffles are teeming in summer with all manner of interesting aquatic life. Here too is a large gravel pit, replete with fossilized remains of prehistoric formations. And the old grove and fields abound with a wealth of insect life.

So with my books of reference, my microscope and a few other pieces of paraphernalia, I usually put in my time enjoyably and not altogether unprofitably.

At the time of which I write, I was especially interested in ants; their anatomy, building habits, social customs and what not. I had even gone so far as to establish a colony of the little creatures in a glassed-in formicary in the library-living room of my town lodgings, where I could have them under daily observation. This year I was looking forward to my month at the old homestead with pleasant anticipation, for I felt sure opportunities for ant study would be abundant.

Shortly before vacation time, however, I received a letter from Kingston; saying among other things that he was going to have a long vacation while his company were remodelling and installing new machinery in some of the buildings of the plant. I lost no time in inviting him to join me at the old farm, where we could fish and rest, or together chase our favorite phantoms and I mentioned in my letter that I intended to give considerable time to the ants.

He replied promptly, saying he would take great pleasure in helping me catch my favorite ant; and asking permission to bring with him a few articles of laboratory equipment, in order to carry out some experiments which he had in mind.

A fortnight later we were sitting on the bank of the old fish pond in the bend of the creek; fishing for young pickerel and scanning the water with a pair of short range binoculars in quest of strange forms of aquatic life. Behind us was the old gravel pit, where we had spent a part of the morning examining some ancient sea shells that evidently had been preserved in the sand since pre-glacial times, when this particular area must have been submerged beneath salt water.

"How about your ants?" asked Kingston. "I hope you are not forgetting them in your zeal to entertain me."

"Oh, no," I replied. "I shall not forget them; in fact I brought these glasses all the way from Washington for the express purpose of studying the creatures.

"I plan to go up on the hill back of the sand pit to look for a formicary this afternoon. There used to be several of them there in the edge of the little grove. You know they like to build on high, sandy soil. I plan to arm my forces with a spade, the high-power microscope and these binoculars and march upon the formicidæ."

"Yes," rejoined my friend very gravely, "Cæsar said that conquests were more often won by the spade than by the sword."

"But to me the matter of impedimenta seems of equal importance. You know Napoleon said, 'an army travels on its belly.' Or was it stomach? Well, anyway I believe leading strategists are agreed that no one ought to risk an engagement with any of the tribes of Hymenoptera without a copious supply of lacteal fluid, rich in casein and lactic acid."

So saying he took the thermos bottle from the basket and drank generously. He was a great buttermilk hound. And now, while he was on the farm where all dairy products were plentiful, he was making the most of his opportunities.

"A valuable suggestion," I agreed. "No doubt the boys will be back from the creamery when we go down to the house for lunch, and we will load the old demijohn with a fresh, cool supply."

AND so that afternoon we took our basket, loaded with the glasses, a few smaller instruments, a bottle of cedar oil for the oil-immersion lens, together with Kingston's beloved buttermilk bottle, and hopefully climbed the little hill that flanked the gravel-pit. Here, as I had expected, we found a couple of very populous formicaries, and chose one close to the shade of a small maple tree for our investigations. This nest seemed to be very nearly, if not quite, on the spot where I had known one to be fully twenty years before, when I was a small boy.

I am inclined to believe that the colony had occupied the same quarters for at least two decades, and possibly much longer. The mound was about two feet in diameter and perhaps ten or twelve inches high. It was made up largely of small twigs and straws, pebbles, etc. The ants were quite large, with red thorax and dark, almost black, abdomen. The female or working ants varied quite extensively as to size and strength of mandibles.

We identified the tenants of this domain as belonging to the group *Lasius Niger*, variety *Americanus*.

Upon examination we found the workers busy at their multifarious occupations. They were carrying in fragments of insects and other articles of food; bringing out rubbish and carrying their little aphids—ants' cows—to and from the pasture grounds. The nurse ants were bringing their charges, the grubs and larvæ, out for an afternoon airing.

In fact all was orderly commotion.

While we watched, a group of workers appeared at the edge of the mound, bringing in a twig several inches long. There were more than a dozen of them at this job, and their performance revealed perfect teamwork.

We were anxious to see something of the substructure of the formicary, so we decided to start an excavation, by digging a hole some five feet deep, at a distance of several feet from the mound.

This we lengthened in the direction of the ants' habitation, in order to reveal a vertical section of the works without too greatly disturbing the inhabitants or injuring their home. As we approached the vicinity of the substructure, carefully shaving the soil away in vertical slices, we came upon the quarters of a colony of minute red ants, whom we at once recognized as robbers. The little creatures were no doubt preying on their much larger neighbors, and living largely off stolen food.

We soon found that the rooms and galleries of the red ants were connected by tiny tunnels with those of the larger formicary, and that these tunnels were too small for the larger ants to enter through. Such an arrangement rendered it possible for the little marauders to slip into their victims' quarters and snatch anything small enough to carry away and duck back to safety with it.

At length we came upon the rooms and galleries of the large ants, and found them busy with their household duties.

Some were taking care of the eggs and young. Many were engaged in carefully cleaning themselves and one another; busily brushing and licking every part of their bodies. Some were at work excavating new chambers and galleries; while others carried the loose soil away. Here again we witnessed perfect teamwork and co-operation.

We found that their workings extended even below the bottom of our five-foot excavation. Owing to the fact that it was a very warm afternoon, we soon lost enthusiasm for digging any deeper, and lay down in the shade to discuss what we had seen.

"They are very clever little creatures, aren't they?" remarked my companion.

"I hardly know whether they have intelligence or not," I replied.

"Some naturalists claim that all that they do is accomplished by instinct alone: that every movement is a reaction to some sensory stimulus; and that their behavior is controlled by something more deeply seated than intelligence. This something is inseparable from the fundamental life processes."

I took out The Field Book of Insects, by my favorite authority, Frank E. Lutze, Ph.D., and read as follows from his discussion of the anatomy of insects:

> "The central nervous system is a double longitudinal series, connected one with another by cords. There is no brain, strictly speaking; for the ganglia in the thorax seem to be about as important as those in the head. Nerves run from each ganglion to near by parts of the body."

"Now if there is no brain," I argued, "how could there be any intelligence?"

"I can't say anything about the brain part," Kingston countered, "but you must admit there are evidences of intelligence. You saw how they all lifted at the same time on that long twig? You see how workmanlike they are in their excavating—each doing his part and doing it correctly. We know that their arrangements of passages and galleries are not haphazard, for each variety has its own characteristic plan of home architecture. The different groups are as easily identified by their building methods as by their physical characteristics.

"It certainly requires intelligence to build such a complicated system of compartments and tunnels, all according to a preconceived plan; especially since they have no blueprints to go by."

"On the contrary," I persisted, "the fact that they always follow a general plan, and that each seems to take little or no notice of what his fellows are doing, only goes to convince me that they are not intelligent.

"IN the first place, the worker ant only lives a few months; passing all her life in a single formicary. We have no reason to believe that she ever studies the inside of any other establishment. Then how could she,

no matter how intelligent, learn the plan and details of a home? She is able to do her part in building as soon as she is fully developed.

"Then again, in all the public works, in all the engineering projects carried on, no one has ever been able to discover anything remotely resembling supervision. There is no master builder, planning and coordinating the work. Now suppose a group of men were about to erect a building. Would it be possible for each one to do as he individually saw fit, without regard to orders from anybody? There would naturally be too many doing one thing, and nobody doing another. There would be too much studding and not enough rafters, or *vice versa*. No one would think of determining where the doors and windows should be, and in fact, with no one to direct and coordinate the work, it is obvious that however intelligent the individual workmen might be, no appreciable progress could be made. All would be confusion, as it was at the Tower of Babel.

"Yet among the ants, all is orderly and efficient."

"Surely you would not say that ants have intelligence superior to that of human beings, or that individual humans could not exercise as much judgment as individual ants could!" I countered.

"Well," said Kingston, "if they have no leader, how do they know who is to go for food, who is to make tunnels, and who is to care for the young, or the hundred and one other things that ants do? You say there are no foremen and no directors; but how do you know that?

"Now look at these workers bringing this twig. Here is a large one struggling along on this side near the front. Let us suppose that she may be the forelady. We might easily imagine her giving directions as she works.

"'Gladys, you are a little too far back. Come forward a couple of paces, and catch hold just behind Mary Jane. Now lift the front end over that stone. Right up high with it!

"'And you on the back, let your end down, so it will slide along on the top of the stone.

"'Now Sarah and Elizabeth, come here and give me a lift. Remember, when we come to that weed stalk, you girls up there in front want to go to the right side of it, not to the left!

"'Now we will let it rest a moment until Evelyn's gang get out of the way with that old log. That gang makes me sick. They dodge around that timber like a bunch of old maid grasshoppers and then when they do get home with one piece, it usually takes them all the rest of the afternoon to manicure their antennæ'!"

"Highly amusing," I laughed, "but hardly scientific."

"Of course you know," he went on, "we can't hope to hear all this; for our great flapping ears are not attuned to the wave lengths that serve to carry their little voices. But I strongly suspect that if we had sufficiently strong magnifiers we could hear their communications, although of course we would not be able to understand their language."

He lit his pipe and went on: "Hearing and sight are very peculiar things; things that as yet we know little about.

"We have made some progress in these matters in recent years. progress in the way of X-rays, telescopes, microscopes and radio; in fact, we have gone just far enough to reveal how great is the field, and how little of it we know. I suspect that we are merely on the borderland of the possibilities still beyond. And then it is just possible that ants and other insects have an additional sense, apart from the five that we possess. It might be somewhat akin to hearing, to sight or to the sense of touch. But since we do not have it, we cannot name it, neither can we have any conception of its nature.

"If all people were blind, and had always been blind, no one could possibly know anything about sight. There would be no name for such an experience, and no one would be able to discover it in the animals.

"Sight is such a marvelous, such a complicated thing, that no stretch of the imagination could have conjured up such a faculty, had it not been known in human experience.

"It may be that throughout their entire bodies insects are sensitive to certain vibrations: vibrations associated with wave lengths we know nothing of.

"We know that light, sound, heat and other natural phenomena have characteristic wave lengths. We know that some of these waves are very long, some very short, and some are of intermediate length. We have been able to segregate a little group of them here and there for purposes of identification, and some of them we can measure very accurately. We know the length of those we sense as color, and those which we utilize in radio, etc. But there are wide gaps between the known groups; presumably filled with waves the uses of which we have yet to discover.

"I might illustrate the thought in this way. Suppose we draw a line through San Francisco, Chicago, Cleveland and New York. It so happens that they are exactly in a straight line; and suppose that only those parts of the line within the narrow limits of the four cities was known, and the long stretches between were unexplored wilderness. This would be a fair representation of our knowledge of vibrations and wave lengths.

"In all probability there are many longer waves—far longer than the longest we know; perhaps hundreds or thousands of times as long. In fact their limits may be circumscribed only by the inconceivable reaches of space itself. And at the end of the scale beyond the short wave lengths there may be countless gradations of shorter and shorter lengths.

"There is, of course, a limit to the shortness of a space that the human mind can conceive of, but there is perhaps no limit to the shortness of a space that Nature can divide. And the possibilities of different forces at work, employing different wave lengths, are absolutely boundless.

"So I say it is quite conceivable that an insect might have a hundred distinct senses, instead of only two or three, or five, as we have. And I believe I am justified in thinking that the mere fact that we cannot see an ant acting as foreman and directing the work, is no sign that such directing is not being done."

"Yes," I admitted, "that is a possible explanation. But I have a somewhat different theory; although as yet it is only a theory. My conception is that a single ant is not an entire individual. In other words, these units that we see are not the entire entity, but only parts of a larger animal, other parts of which escape our notice.

"PERHAPS I can explain by using the following illustration. Suppose in the case of a hundred-legged worm, the common centipede, that we were able to see only the legs and the feet and the body were completely invisible. We would then have two rows of feet and legs

going along, all nearly alike and all keeping in line, all marching at the same speed and at uniform distances apart. If one line should turn, the other would turn also. There would appear to be perfect cooperation and teamwork.

"Because we could see no connection between them, we might suppose that each was a complete animal, and that each was intelligent and highly efficient as a marcher; and we would naturally wonder how the general movements of the whole group were directed. Or, to put it in another light. Suppose there were a race of beings so constituted that they could not see our bodies, but only our hands.

"They would be interested in watching our hands doing all manner of things; writing, using tools, operating machines and so on. They would naturally suppose that our hands were possessed of intelligence; yet upon examination, no brain could be found. Then suppose we had a dozen hands; a hundred; or even as many as an ant hill has ants. All these hands might be at work with seeming intelligence, and no particular hand would appear to be directing the others as to what to do, or how to do it.

"Of course I know you might find objections to this analogy, as applied to the ants. You may say that each ant has its own organs, such as digestive apparatus, sight and smell. And I might answer: so does every part of an amœba have its own organs, or rather the functions of organs. Each part digests the food with which it comes in contact. The parts move and react to stimuli, although there is no brain and no nerves or sense organs, as we know them.

"Then again, our own hands have certain sense organs, such as the sense of touch, sensitiveness to heat and cold, etc. I see no reason, therefore, why Nature could not add other senses, such as sight and taste; in fact, all the senses we know and others that we know not. So perhaps these ants that we see are only a great many operating parts of one animal. As we have hands, fish have fins; an octopus has tentacles; and so this thing has ants."

"Yes, yes, go on," said Kingston whimsically. "You are making my world larger every moment. Let me see the rest of your strange beastie."

"Well, I hardly know if I can do that," I admitted. "You know vision has its limitations. There may be nerves, or substitutes for nerves, right before your eyes, passing from each ant to some central location; but you cannot see them. Let us consider a nerve. It is a little string of white, fatty substance, extending from the brain as a ganglion to some portion of the body. When a message passes along this substance, we do not know what is really happening. Apparently there is no movement of the nerve substance, and no change in its composition. So we are led to believe that the nerve itself has no intelligence nor mechanical energy; and that it only acts as a passive medium on which the message travels.

"WE do not know what a nerve message really is. To our senses it has no tangible form or substance; but our reason dictates that it is a movement of some kind of energy, perhaps a series of vibrations of some sort; possibly akin to light, heat or electricity. And the human brain, knowing far more than we know, is able to interpret these vibrations in terms of sight, smell, touch, etc. Or, if the vibrations originate in the brain, some organs in the muscles—organs which we have yet to discover—have power to translate them in terms of motion. I think that so far my hypothesis is altogether reasonable, is it not?" I asked.

"Yes, I can agree to all that," my friend rejoined; "go on."

"Well," I continued, "sometimes we send messages—such as telephone messages—on a wire; and sometimes we dispense with the wire. We just give the words a little impulse by the help of some electrical apparatus, and let them find their own conductor. And they go all right. We cannot see them as they travel on; but when they arrive at their destination, perhaps thousands of miles away, they reveal themselves to human consciousness fully as well as when sent by wire.

"In fact we are already commencing to think of writing as a somewhat superannuated and archaic method of communication.

"It is within the province of reason to suppose that while Nature can and does send messages over nerves, as we send them over wire, she can also dispense with that little line of fatty matter as readily as we can dispense with the copper wire, and send messages as we send them over or through or by some medium that is impereeptible to human senses.

"We often hear of some instance that would tend to justify this belief.

"I remember when I was a small boy I heard my uncle tell how he met with an accident while operating a well-drilling machine. Something sharp struck his right hand with such force that it passed through his leather glove and completely severed his little finger at the second joint.

"Realizing that his hand was badly injured, he immediately started for the doctor's house. (It so happened that the doctor lived close by.)

"He removed the remains of his tattered glove as he went, and in so doing let the severed portion of his finger fall to the ground. Paying no attention to this incident, he hurried on to the doctor who dressed the wound.

"This happened in the winter; and soon my uncle commenced to experience the feeling that the missing finger was cold. But since there was really no finger there to get cold, he tried to ignore the feeling.

Presently the weather became more severe and the pain increased. At length he decided to find the severed member, and put it in a warm place. This he was able to do after a somewhat prolonged search, and promptly the distress was relieved.

"I might relate a number of similar instances, and maybe you know of some yourself.

"But the point is that our nervous system may not have to use a continuous, tangible nerve to register feeling."

"Let's take a drink," said Kingston. He turned to the basket for his bottle.

"What happened here?" he exclaimed. "The cork is out of the thermos, and the little oil bottle is broken. Everything is in a mess!"

"I hope your buttermilk isn't all wasted," I said. "I suppose I must have hit the basket with the spade when I was digging."

"Oh, I guess there is not much gone," he replied, examining the bottle and taking a drink.

I HASTENED to take the microscope and binoculars out of the mixture of cedar oil and buttermilk in the bottom of the basket.

I laid the glasses aside, meaning to wipe them dry after attending to the basket. But we fell into further discussion, and I forgot them.

Half an hour later, perhaps, I had occasion to use the binoculars to examine some detail of the formicary. As the lenses came into proper focus, I noticed a small blotch of slight cloudiness on one of the glasses. I at once thought of the spilt oil and buttermilk, and was on the point of interrupting my observations to wipe the instrument, when something quite unusual caught my eye.

It was a tiny gleam of brilliant color, which lay just beside a medium-sized worker ant. As the ant moved along, the particles of color moved with it.

My first thought was that she was carrying something that reflected the sunlight. Yet this seemed impossible; for the bright spot appeared to be about midway along the thorax. As the worker mounted a little rise, the area lengthened and became a thin thread of silvery, shimmering blue. Then this thread lengthened and shortened as she moved on. Another ant moved into the clouded area; and immediately I discovered that she also was accompanied by a similar fragment of color.

By this time my curiosity was thoroughly aroused. I focused on other ants, and found them all accompanied by the same phenomenon. And to my ever-increasing surprise, I found that in some cases this line of brilliance was very long. In one instance, where a small worker was mounted on a twig, the strange glimmer was fully two inches long. It was like a ray of some peculiar kind of light.

I now noted that from all the workers within my observation the color line extended in approximately the same direction; that is, toward the center of the formicary, regardless of which way the ant was facing.

As I was puzzling over this, Kingston's voice broke in on my consciousness. He had noticed how intent I was on the spectacle, and had no doubt detected a look of astonishment on my face.

"What is it?" he said. "Are you seeing a ghost?"

"I hardly know what it is," I replied in my bewilderment.

I handed him the glasses. "Look at the ants through the clouded spot in the right lens," I directed.

He held the glasses to his eyes. I watched him with interest.

For a moment the binoculars were stationary. Then I saw that he was moving his line of vision from place to place. Evidently he was transferring his attention from ant to ant, just as I had done.

"What do you make of it, Watson?" I asked.

He did not answer. Very soon he focused the glasses on the opposite side of the ant-hill for a few moments. Then he picked up a twig from the top of the mound and held it before him. He noted that several of the inhabitants clung to the twig. At length he lowered the glasses and turned on me.

"What can it be?" I said, hoping that he might have some explanation.

He stared at me as if unable to comprehend my question.

"Why, my God, man, what do you suppose it is?" he asked as if entirely out of patience with my density. "What were you just talking about?"

And then with an abrupt change of manner, he extended his hand.

"My dear fellow," he said, "I want to congratulate you on having made the greatest discovery in zoology of the twentieth century! It is, beyond question, the nerve system of the ant colony!"

"But why," I said incredulously, "has no one ever seen it before?"

My companion was examining the spot on the lens.

"I suppose," he replied, "that no naturalist has ever before had the good fortune to spill just the exactly correct mixture of cedar oil and buttermilk on his lens. We must preserve this dried film with the utmost care."

AGAIN we took up the examination. We found a worker several feet from the mound, and had no trouble in discovering the bright line and tracing it from her all the way to the side of the ant hill.

Then we thrust the point of the spade into the formicary, and took up a mass of the building material covered and filled with ants.

Holding this above the mound and focusing the glasses on a point below it, we beheld innumerable lines of brilliance extending to the formicary.

It resembled a wonderfully illuminated waterfall.

"I have no doubt that the queen ant is the center of this marvelous system," I announced. "We ought to continue our excavations until we find her."

"It might be quite a long job," said my friend. "The sun is getting low, and that bank of clouds will soon obscure it. So maybe we had better wait until morning."

"I am afraid to put it off," I replied with some impatience, "because it may be that, when this film on the glasses dries a little more, it will lose this marvelous quality. And then we might never know the origin of the lines. We might never be able to hit upon just the right combination."

"Yes, you may be right about that," he admitted; "and in that case we had better go on as far as we can tonight."

So I hastily started digging again; shaving the vertical layers of the formicary, stopping every now and then while Kingston examined the direction of the lines.

But very soon the sun's rays commenced to lose their brilliance; the lines became increasingly hard to detect and follow.

So we decided to call it a day and go home. That evening we determined to treat some panes of glass with cedar oil and buttermilk, to see if by any chance they would give the same effect as the lens. We cleaned a dozen or more photographic dry-plates, and covered them with a thin film of cedar oil and buttermilk mixed in varying proportions.

These we set aside to dry. Then we treated the other lens of the binoculars with a mixture that we hoped would be effective.

The next day proved to be rainy; but during the day there occurred several short periods of sunshine between showers. We took advantage of these short periods to test our treated glasses.

We soon found that none of the plates gave any results. Neither did the newly covered lens; but we were gratified to find that the original clouded one still retained its magic quality. It was evident that we had not hit upon the proper proportion of oil and buttermilk. The lens seemed to be too opaque. This was presumably due to too great a proportion of buttermilk.

We hastily prepared a more attenuated mixture, and replaced the old coating. During a later period of sunshine, we found that this new film gave perceptible results, but was far from satisfactory.

After several trials, with varying proportions, we finally arrived at one containing only a trace of buttermilk.

By this time the sun was so low that we had no further opportunity to test our work, and so were obliged to postpone further experiment until the following day.

Fortunately the morning was clear and light. We were at the formicary bright and early. To our great delight we found that our newly treated lens was a success. In fact it was quite as clear as the old one, and of course afforded a much larger field of vision, so that now we were able to observe a large group of ants at one time. When a large number were lifted from the formicary *en masse,* it gave a very beautiful effect. The brilliant lines were so close together that in some cases the eye could not separate them; but they never seemed to cross.

By manipulating several groups in the air at one time, we provided some very striking effects. We were so entranced with the brilliance and beauty of the spectacle that it was only with the greatest reluctance that we at length forced ourselves to go to work.

We now continued our excavation; one watching the direction of the lines from near by ants, while the other removed the soil and deposits of the formicary.

Upon arriving at a point near the center of the mound, and two or three inches above the surrounding surface soil, we came upon a locality where all lines seemed to converge. But to our surprise there was no queen ant present. In fact there seemed to be only a deposit of ant eggs in an exceptionally large cell. Using the low power lens of the microscope, we discovered that there was indeed a very minute basket-like arrangement, apparently composed of silken fibre such as that from which the ant grubs spin their cocoons.

Switching to the 444 lens, we were able to make out that the little container was filled with an almost transparent liquid.

ALTHOUGH we investigated carefully, we could see nothing further, and upon segregating the tiny basket-like object and moving it about, we discovered that the convergence of the bright lines moved with it, following it from place to place.

Apparently there was nothing to do but try the oil immersion lens. Yet we hesitated, because we feared that the oil to be used might prove fatal to the animal matter, in case there really was a living creature present.

After some discussion, we decided to carry on. I brought a large flat stone, on which we carefully mounted our microscope and an auxiliary light condenser. Then with the tiny basket mounted on a crystal slide, we commenced our examination. I knew that Kingston was a very accomplished microscopist, and I permitted him to take charge of the work.

For some time his efforts were unsuccessful. But at length he announced. "I believe I have it."

A moment later he affirmed emphatically. "Yes, here it is, sure enough. And it's alive," he added presently. Needless to say I was all agog, and impatient to have a look; and my companion soon gave his place to me.

Immediately there appeared before my vision a very minute but quite distinct object. It resembled an imperfectly formed brain. It was palpitating slightly; and as I gazed spellbound, it moved perceptibly with an amoeba-like motion.

Apparently it was suspended somewhat below the surface of the crystal-clear liquid in which it was immersed.

"Undoubtedly that is the brain and nerve center of the whole colony," declared Kingston. "I have no doubt that it is hatched from a special kind of egg; and that it draws its nourishment from this bath in which it is immersed, after the manner of an amoeba."

"Probably the ants deposit predigested food substances in the bath. There regurgitated foods may be prepared and concentrated in the digestive tracts of especially adapted workers. Or it may be that the queen herself performs this as a royal duty."

"I doubt very much if it comes from an egg," went on Kingston. "I think it is more likely in the nature of an amoeba. That is to say, its method of reproduction is by division, and like an amoeba, its life is eternal, except in case of destruction from outward sources. Perhaps after a subdivision of the organism the superfluous brain is carried away by a young queen, about to institute another colony; in the same manner as a young queen often flies away with a number of small wingless workers, or a fragment of fungus culture with which to start a new establishment."

"Be that as it may," I replied, "I think we can safely say that this is the animal itself, possessed of brain power and intelligence; and that what we call ants are only its multitudinous appendages; the queen being in reality only its reproductive organ."

"The various parts of its anatomy are not connected one with another by organic tissues. But they are connected and coordinated into one complete entity by this marvelous and beautiful system of nerves; this network of lines of force."

"This is indeed a great discovery," said Kingston impressively. "And I foresee that it is sure to have far-reaching results."

After a moment he went on. "If we could only discover what this nerve energy is, and determine the wave length of its vibrations, we could apply the force to all animals. We could revolutionize all industry!"

I will not dwell on the account of our further investigations. Suffice it to say that we returned to our respective employments after vacation; and I spent my spare time in preparing a report to submit to the entomological society. I prepared it with much care and elaboration; for I was convinced that it would create a furor when it came to the notice of the scientific world.

MEANWHILE, as his letters revealed, my colleague was busy in his little home laboratory, trying to analyze this peculiar nerve force that could travel through space.

One day I received a letter full of jubilation.

"I find," he wrote, "that it is not far different from light; its wave length is not a great deal shorter than those at the violet end of the spectrum."

He went on to say that he was trying to produce an apparatus that would generate this force. He also suggested that we give a name to this new found entity, in order to distinguish it from light, electricity, etc., and aptly suggested the name "Formicidary Rays."

A still later letter advised me that he had succeeded in producing a generator that was something like a cross between a dry battery and an X-ray machine, and that he was now able to produce visible lines of formicidary rays at will.

I asked for a few days' leave of absence and took a hurried trip to his home, where I found him hard at work in his laboratory.

"I have asked the company for three months off," he explained, "and they have retaliated by electing me to the position of third vice-president. As yet, the third vice-president has no duties prescribed, so I am at leisure and entirely at your service."

He showed me his new apparatus, and proceeded to demonstrate it.

"For this work, I have been able to expose one of my nerves," he explained as he unwrapped a finger that I had noticed was bandaged. He displayed an incision in the flesh that revealed a small silvery white line, easily discernible with the pocket lens.

He immersed his finger in a transparent bath contained in his apparatus.

"I know this is a very crude method of connecting up," he observed; "but I have no doubt I shall be able to get away from it when I have had time to perfect the details."

"Here, you see, is my subject," whereupon he picked up a small glass box containing an ant; at the same time he operated a number of controls of his mechanism.

"Now, take the glass and watch for the nerve line," he directed.

I did so; and immediately saw that the line was established, extending from the ant toward the operator.

"You see, I am using my own brain for sending," he explained. "You will perceive that my subject is eating a bit of honey. Such reflex actions can be carried on without intelligent direction. But now watch what she does. I am going to direct her to go and get that straw."

A small fragment of straw was lying some distance behind the ant. At once the ant ceased eating, and abruptly turning round, picked up the straw and made off with it.

"That will do, Sarah," said Kingston with a chuckle. The ant dropped the straw and went back to the honey.

"What do you think of that?" asked my host.

"I think you are a wizard," I replied hastily.

"No, I am not," he said; "I am only an amateur scientist. Next time you come I will have a guinea pig perform for you."

"I'm willing to believe anything now," I said. "I am fully prepared to see anything happen. But tell me; why do you think you can apply this to animals also?"

"I have reason to believe," he answered, "that a like force actuates the nervous system of all animals. The only difference between the ants and the others is that the ants have a specialized sending apparatus—broadcasting mechanism if you will—that causes the message to travel on nerves where there are nerve fibres, and in space where the nerves are lacking; whereas the others are possessed of an apparatus that sends over nerve fibres only.

"Now if we can find a way to convey messages to the nerve centers and ganglia of an animal in such a way that they will come in stronger than those from the animals' own brain, we can control the actions of the animals' body.

"Suppose a dog is standing with one foot raised off the ground. There will be messages coming from the motive part of the brain to the ganglion and nerve center through which the nerves pass governing that foot; saying in substance, 'Keep that foot up'.

"But if we can send a stronger, more impressive message saying 'Put that foot down,' the foot will go down; and Mr. Dog can like it or not."

"I wish you would go a little easy on that buttermilk," I said with mock gravity. "I am really afraid it is affecting your mind."

In spite of my little joke I was conscious—perhaps more strikingly than ever before—of being in the presence of a superior mind.

I was convinced that a great realm, which to me was dark and full of the deep secrets of life, was to him an open book.

And now some years had passed. Mr. Kingston's company, of which he was still a vice-president, had undertaken to construct the long-projected tube from England to France. And my old-time friend was in charge of operations, under the title of chief engineer, which brings us back to the afternoon when my story opened.

This extraordinary scientist mused a few moments over my declaration that my part in the early discovery had been a mere accident.

"Yes," he said, "there was an element of chance involved, to be sure; but almost all discoveries have been to some extent due to chance; look at the way the Chinese discovered roast pig. This is cleverly told by Charles Lamb in his 'Essays of Elia.'

"But usually the accident doesn't mean anything, unless one has a theory first. You had a theory; and the accident only served to verify it."

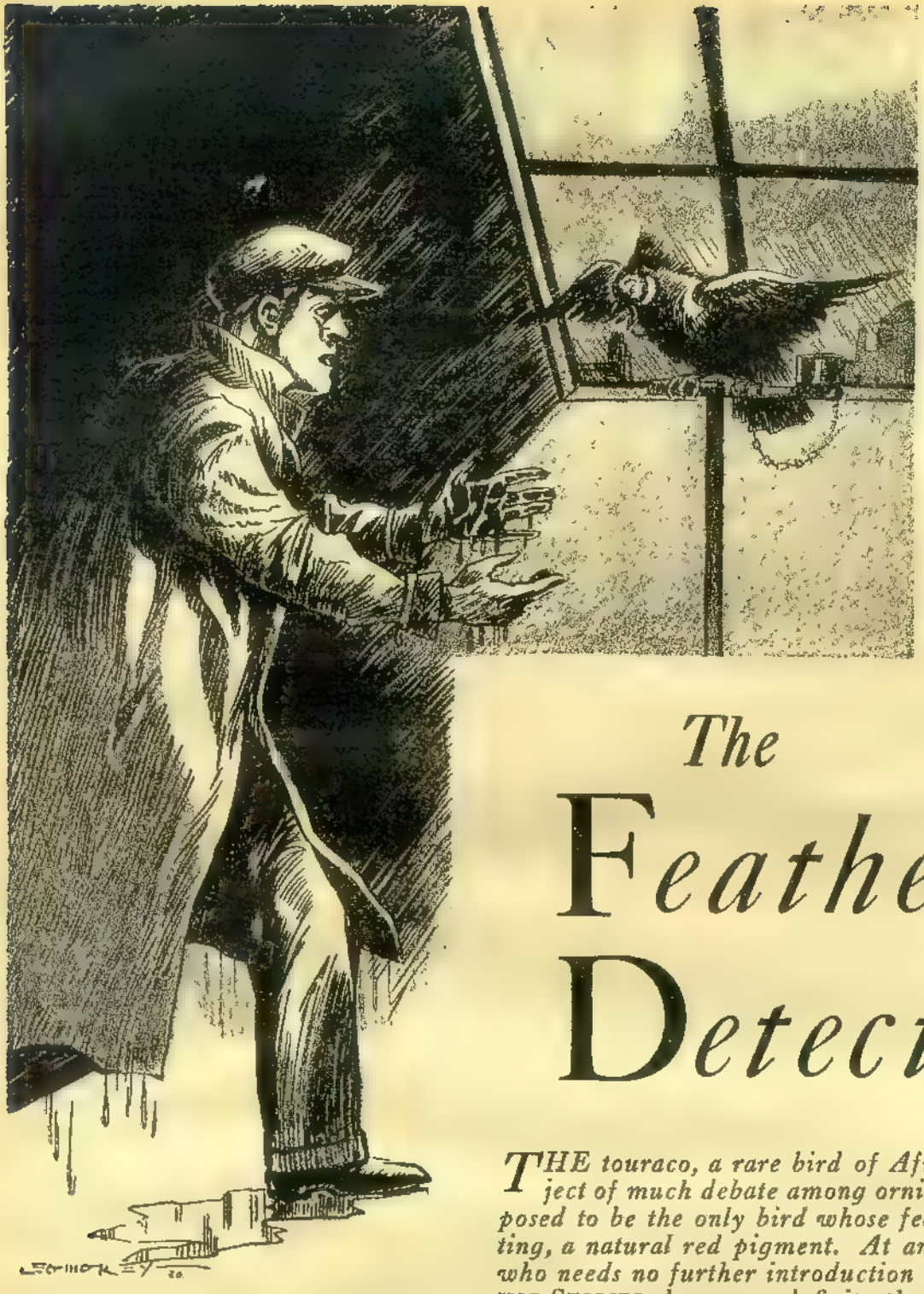
"The important part of the accident was that you happened to be there to see it," I rejoined. "Had it not been so, the most that could have come of it would have been a rather carefully worded report to the entomological society."

"Well," Kingston said, "the good old tube is more than half done now.

"It is ten times as large as the old engineers dared to propose. And in all the departments of the undertaking except where heavy machinery is indispensable, the work has been done by very efficient animals of more than forty kinds."

"And when the thing is finished, something seems to tell me that we shall see your picture in all the leading newspapers and magazines of the world," I said in answer to his modest statements.

THE END



¶ *It became quite obvious, when I looked at the bird, that the murder had been committed before the bird was killed.*

By

A. Hyatt Verrill

Author of "Into the Green Prism," "Beyond the North Pole," etc.

Illustrated by MOREY

The Feathered Detective

***THE** touraco, a rare bird of Africa, has been a subject of much debate among ornithologists. It is supposed to be the only bird whose feathers yield, on wetting, a natural red pigment. At any rate, Mr. Verrill, who needs no further introduction to readers of* AMAZING STORIES, *has some definite theories on this subject, based on careful study and investigation. And under his skilful handling "The Feathered Detective" takes on an individuality that easily puts it on an equal footing with the best scientific detective story.*

BEN POLLARD owned the Blue Lion Inn at Hobham, but nobody in the village really knew anything about Big Ben, as he was called. Not that there was any question that he owned the Blue Lion, for he had bought it from old John Blaber, paying for it with good Bank of England notes and gold sovereigns. It had been the "White Lion" then, and Big Ben's first act, after the bill of sale and the deeds had been signed, was characteristic of the man

Cocking his head to one side, thumbs in the armholes of his waistcoat, he had squinted up at the weather-beaten sign with its white lion rampant on a faded black background.

"White Lion," he had observed, speaking to no one

in particular. "White Lions and Black Lions all about. I'll lay a quid to a farthing there's one in the next village."

"Two on 'em," vouchsafed old Andy Prout, nodding his bald head sagely. "An' anither to Clacton."

"Aye, an' one over to Ripley, an' the Black Lion to Church Poges," added Sam Ryder. "Aye, the's plenty on 'em hereabout."

Big Ben spat. "Thicker'n ticks on a sheep," he rumbled. "White Lions and Black Lions and Red Lions all over the bloomin' place. I ain't never seed a willage without 'em, an' I'm a keen un for pubs at that. But never a Blue Lion nowheres, an' this pub's agoin' to be the Blue Lion arter now. Aye, I'll bet two quid to a ha'penny there ben't another Blue Lion in the whole United Kingdom o' Englan', Irelan', Scotlan' an' Wales. So one o' ye run along an' fetch the sign-painter for to paint yon lion blue once an' for all. An' mind there's a ha'pint to the lad as gets here with him first."

Still, as I said in the beginning, nobody really knew anything about Big Ben; who he was, whence he came, or even if his name really *was* Ben Pollard. He had arrived on the Portsmouth motor-coach one wild night, bundled up in a great sea-coat against the wind and slashing rain, carrying a bulging black portmanteau and a big parrot cage wrapped in newspapers to protect the green bird inside.

He had taken up his quarters at Blaber's inn, and though the villagers had been a bit curious, as village folk are, they hadn't learned anything about the man during the months he had lived there. He was a free spender, seemed to have plenty of money, and being a genial soul, always ready to buy a pint for anyone ready to pass an hour with him, he was accepted at his face value and was generally liked.

He was a big man, well over six feet and weighing all of fifteen stone (two hundred and ten pounds); broad and thick, with a trick of standing with legs widespread and head cocked to one side—"Like a bloomin' sailor," as Johnny Handy put it. His face was tanned, his nose sharp and crooked a bit to one side, and he wore a short crisp beard, that, like his thick, tousled hair, was flaming red, streaked a bit with gray.

Old Abner Spree claimed to be over one hundred years old and had been to sea as a young man. He said if it had been seventy-five years ago he'd have sworn Big Ben was a bloody pirate, and he got very reminiscent and spent the whole evening telling stories of days when he was at sea and the adventures he'd had. No one doubted that Big Ben had been a sailor, but no one asked him, for good-natured as he was and liked as he was by all, still there was that about him that made a body hesitate to pry into his affairs or ask personal questions.

And he was a man of very regular habits. Every morning he was up before sun-up, and carrying a heavy stick that was near to being a club, and dressed in Harris tweeds, he'd go for a long walk through the fields and spinneys. Many's the time I've met him as I was driving to Guildford or to Kingston, striding along as though he were walking on a wager, whistling or puffing furiously at his big black pipe. Or I'd see him sitting on a stile or a rock maybe, watching a flock of rooks or gazing up at a singing lark, or maybe as intent on studying some bug or tree as one of the scientific chaps from Kensington.

Regular as a clock, too, he'd be off to London, starting by the first motor-coach in the morning and getting back in the evening, and always with a black leather bag in his hand. What he did in London nobody knew, but we all thought likely 'twas to his bank he went, for "Blaber's Inn" had always had a good trade, betwixt the folks round about and the tourists forever passing back and forth on the Portsmouth Road, or stopping off to see the old houses and the church and what not at Street Hobham. And since Big Ben had owned the Inn, the business had picked up most amazingly. He had his beer and ale cold—that pleased the American tourists immensely—and there wasn't a pub 'twixt Portsmouth and London could old a candle to the Blue Lion for food. Moreover, Big Ben had fixed up the old place till 'twas like a museum to see, what with heads of foxes and red deer and stags, and stuffed pheasants and birds, and big pike and salmon on panels on the walls, and rusty old guns and swords and what not, together with ugly idols from Lord knows where, and curios from foreign parts.

A great hand he was for collecting this, that and the other, buying old junk in the way of chairs and tables and settees and old pewter and china. And there was his parrot in its cage, a fine green bird big as a pigeon, though whatsoever he wanted her for I don't know, for she never talked, but croaked and whistled a bit and screamed fit to deafen one. But the place *was* cozy, and Big Ben had the neatest bit of a barmaid that eyes could see—a pert, bright-eyed, laughing lass with hair as red as is own, but a right proper girl at that.

So, taken altogether, the place did a right roaring trade and the silver came in fast and Big Ben had every reason to go to London to bank his savings every week.

Still 'twas queer, as we often remarked, that whenever strangers were about and the tap-room and bar-parlour were crowded, Big Ben never was about. He'd be sitting alone or with a crony or two in the little back room with a mug of mulled ale or maybe arf an' arf, and his big black pipe, and most often with his coat off and his shirt open showing his hairy chest with a bit of blue tattoo on it. He'd be as chummy as is, but never did I know him to tell a word of his past, or a tale of the sea, or of the foreign parts he must have been to. Now and again some one of us would try a bit to draw him out, mentioning this, that or the other thing quite casually, or maybe speaking of something we'd read in the press about some foreign place or even getting old man Spree to start in on his everlasting stories we'd heard a thousand times and more. But it wasn't any use. Big Ben'd nod his head, or maybe roar with laughter till the mugs rattled, and swear 'twas marvelous or past belief, but never a yes nor a no nor a when I was to this, that or the other place. I mind one day that Tom Dickey asked him about that parrot of his. Asked what Big Ben kept her for, as she didn't say so much as "Damn," and then asked where he got her.

"Them as talks least says the most sense," said Big Ben, cocking his ead one side and peering at te bird with eyes half shut. "And she's a wery remarkable Poll at that," he goes on. "In fact," he says, *"the* most remarkable parrot in the world, I might say. Of course ye can't see it," he says, "neither can a lad see anything so remarkable in another lad's sweetheart, though he'll think there be none like her on earth. 'Tis the same with her"—jerking his thumb towards the cage hanging

in the window. But he never answered Tom's question about where he got hold of the bird, I noticed.

BUT he must have told the truth about her being so remarkable, for one day a party from America was stopping in at the Blue Lion, and having their ale and bitters and what not, as they waited for luncheon, and one of them—a nervous, thin old fellow in knickers and with goggles, jumps up and goes over to the bird hanging in the sun. "My goodness!" he exclaims, for I was in the bar having a drink and a chat with Bess, and I heard him. "My goodness gracious!" he says a second time. "Where on earth did these people get hold of this bird! Why, as true as I live it's a touraco. A *most* remarkable specimen and the only one I've ever seen in confinement."

One of the ladies laughed. "Why, Professor," she said, "it seems just a common green parrot to me. What's so remarkable about the creature?"

The old fellow snorted. "And those worm-eaten old chairs you raved over this morning looked just like any ordinary old chairs to me," he told her back. "What was *so* remarkable about them, I'd like to know?"

"Why, why, they were old—they were antiques, and very, very rare," she says.

"Exactly," snaps the one she'd called "Professor." "Well, this bird is *not* old and he is *not* antique, but he's very, very, and then again very, rare, if you want to know. In fact, it is quite *the* most remarkable bird I have ever seen and well worth my visit to England."

"Oh, *do* let's buy the precious thing, then," says another lady. "I'm having my boudoir all finished in just that delightful shade of green and the dear bird will be in perfect harmony."

But I expect Big Ben must have been listening also, or maybe the waitress or someone told him, for just then Jimmy the porter comes in and takes the bird, cage and all, and starts to go out. But the Professor stops him.

"Will you inquire of the owner of the bird if he will dispose of it, and for how much?" he says to Jimmy.

But Jimmy comes back and tells the Professor that the owner doesn't care to part with the parrot, at which the lady with the green boudoir laughs and says she has never yet found anything that money won't buy, and will five hundred pounds make the bird's owner change his mind. Jimmy's eyes fairly popped out of his head at that, and I came near to spilling my bitters and grabbed at Bess for support. I was that put out about hearing the lady offering five hundred quid for a green parrot that I didn't even talk. "Mind where you're putting your hand," snaps Bess, giving me a smart slap. "But my Gawd, she said that as easy as I'd say sixpence!"

And when Jimmy comes back and says as how the owner—meaning Big Ben, of course—wouldn't sell, not for five hundred nor for five thousand pounds, Bess grabbed me, and *I* didn't ask her to mind where her hands were nor slap her, you may be sure, and for the matter of that neither of us noticed; we were that amazed to think Big Ben put so much store by his parrot that couldn't say boo. Well, the upshot of it was that Big Ben's green parrot became right famous—what with everyone talking about his having refused five hundred pounds for the bird—and everyone would drop into the Blue Lion just to have a look at the bird, and of course they'd have their drinks, and as I told Sam Ryder, and the others agreed, Big Ben wasn't such a fool as we'd thought to refuse the American lady's offer, because he was making more out of the bird being so famous than he'd have got from her—that is if the parrot didn't die on him.

But of course there *was* a bit of gossip going about, too. A man who could refuse five hundred quid—or five thousand, he said—as easy as is, must be rich, and even with all that he was making at the Blue Lion it began to get about that Big Ben had a tidy bit of gold. Of course it was nobody's business. He had as much right to money as the next, and for all anyone knew he might have got it in the gold fields somewhere, or by honest work or saving or any other way. But there's no place like a village for gossip, as you know, and folks began to recollect how he came to Hobham, how he paid for the inn with gold pieces and that they really didn't know anything about the man.

Now, I'd known him ever since he'd come and I hadn't noticed anything strange nor mysterious about him—except maybe his not wishing to be about among strangers, which wasn't mysterious, but just natural, seeing how he preferred going about without his coat and collar, and was never one to dress up. But others said his trips to London were suspicious, though Lord knows why, and that he might have been a robber or a bandit or a gambler or some sort of a scoundrel before he came to Hobham, and why didn't he have friends or ever get letters? And when the maid at the Blue Lion told Mrs. Gregg that she never in all the time Ben had been there had seen his big portmanteau open, but that it always was kept locked, and said he always kept a loaded pistol in his room, everyone began to say Big Ben had a past and kept some secret locked up in the portmanteau.

There were some of us laughed at this talk—I did, and Sam Ryder and two or three others who knew Big Ben pretty well—that is, as well as anyone in the village knew him. But old Andy Prout and doddering old man Spree shook their heads and said they wouldn't be a bit surprised if Big Ben had been a pirate or something worse.

It was about this time that a stranger came to Brenton's Heath and put up at the Old Bear there. I was over to the Heath the day he came and at first sight I gasped like a fish out of water, for back-to as I saw him when he got off the bus, he was so like Big Ben I thought 'twas he himself, though I knew he was over to the Blue Lion at the same time. Yes, sir, the stranger was the same build as Big Ben—broad as an ox, tall, and he even had the red hair. But he was a younger man. I could see as he turned about, there was no gray in his hair and no beard. But the same sort of nose and tanned like he'd been long at sea or in some hot land, and with a big ugly white scar running across one cheek and making his mouth turn up at the right side as if he was ever grinning on one side of his mouth. He walked like a sailor, too; legs spread, but didn't cock his head aside like Big Ben. I don't know as I can quite make it clear, but somehow I got the idea that while Big Ben was a good-natured, easy-going, good-hearted chap, even if a bit rough in his ways, this fellow at the Old Bear was a nasty dispositioned, surly sort, and one as wouldn't stand for any humbugging or nonsense. Still, he spoke fair enough as he tipped the porter for

carrying in his bag, a black portmanteau as like Big Ben's as two peas in a pod. Yes, aside from the beard, and he being a younger man, I'd have said he and Big Ben might have been twin brothers. But there was one thing; this man didn't bring a parrot with him.

Well, I had it in mind to mention him to Big Ben, when I got back to Hobham; thought he'd be interested in knowing there was a stranger so like him over at the Old Bear. But what with one thing and another I clean forgot it, and I didn't think of the stranger again till the next day, when Big Ben being off to London and I dropping in to have a mug of ale and a word with Bess, who should come into the Blue Lion but the stranger from over to the Old Bear. I didn't like the way he leered and winked at Bess, who was a right proper lass, as I've said, and not one to be free with, but he spoke civilly enough, and ordering a "gin and It" sat himself down on a settle and lit his pipe.

"Maybe," says he after a bit, "you may know if there's a party hereabouts by the name of Tom Henley."

I looked at Bess and Bess looked at me and we both shook our heads. "No," I told him. "Man and boy I've lived here or hereabouts all my life, and I know every man, woman and child in this corner of Surrey. But there's only two Henleys I know of. One's the widow Henley over to West Clacton, and her man was killed in the war and his name was John, not Tom; and the other's Bill Henley, the constable at Esher."

The fellow dropped the lid to his left eye and looked at me like I had two heads or maybe a tail or some'at of the sort. "Hmm," says he. "And maybe the lad I'm asking about's not known as such hereabouts. Maybe he's hoisted false colors, so to say, and's a sailin' under another name. Maybe if I told you what sort he was you'd know of him. A big man he is, nigh the same size as me, with red hair and a bit gray and likely a whisker on his face, but no scar to twist his mug to one side like I carries. Maybe for a crown you can recall such a lad as bein' seen hereabouts."

NOW I can't say to this minute why I didn't tell the chap he was describing Big Ben to a T, and I don't know likewise why Bess kept a still tongue in *her* head. But the stranger had asked for Big Ben under another name, and if Big Ben wanted to be Ben Pollard instead of Tom Henley, it was likely he had reasons and 'twas no business of mine to be telling this stranger that the man he was asking for and Big Ben were one and the same.

And I expect Bess felt the same, because we felt Big Ben was a decent chap, no matter if he wasn't Big Ben Pollard at that, while this chap, sitting there and asking us questions, wasn't the kind of a lad we'd coddle to.

"So you don't know such a lad, then?" says the stranger, drinking the last of his "gin and It." "Well, that's damn queer," he goes on, half-talking to himself. "They told me over to the Old Bear as how I'd find the lad I'm lookin' for over to the Blue Lion here. Said he ran the place, they did. Now what's the game, me lass, and you, me lad, tryin' to stall me off by sayin' there's no such man in these parts? Who's the owner of this pub, I'm askin' you?"

I'm a quiet lad as a rule, but I've got my temper at times and the tone and the words of this fellow with the crooked mouth didn't suit me.

"Look you here," says I, a bit hotly, I expect. "Who you are or what your business is, I don't know and I don't care a damn. You're a stranger here and you come prying into other folks' affairs and sitting there asking questions like you were in a bally police court and you the magistrate. If you want information, why the blazes don't you go to the police and ask them? And if you want to know who the owner of this pub is, come round this evening and ask Big Ben himself. So put that in your pipe and smoke it, laddy me lad."

The fellow grinned and stood up. "No offense intended," says he. "But how, may I ask you, did Big Ben, as you call him, buy this tidy bit of a place? With good gold, I'll warrant. And where do you suppose he got gold, me lad, with no gold knocking about ol' England since the war? In some foreign port, of course. And how do you know *how* he got it? Maybe by hook or by crook, maybe by honest work, and maybe by sheddin' a bit of some other lad's blood an' helpin' of himself to what he wanted. Have you thought o' that, me lass and me lad? Have ye thought that maybe Big Ben, as you call him, is a bloody murderer and wanted by the police? And maybe there's a tidy bit of a reward for him as you two might be dividin' for to start housekeepin' with, and maybe that's why he's Big Ben and not Tom Henley no more. So——"

But he got no further. Bess was a quick-tempered lass, and she turned as red as her hair, and, picking up an empty stout bottle, she shied it at the fellow's head. She was a good shot, Bess was, and the stranger ducked just in time. And not quite in time at that, for the bottle struck him fair and square in the shoulder. He spat out an oath and started for us, but just then the door opens and in comes Sam Phillips, the postman, and Billy Hart, and, with a glare and a mumbled curse, the fellow goes out.

"Who's the big lad?" asks Sam, as he and Billy come over to the bar. "He's as like Big Ben as is, savin' the scar on his face and lackin' the gray in his hair and the beard to his cheeks and chin. A stranger, I'm thinkin'!"

"Aye," says I, "and no welcome one at that, to my way of thinking. He's stopping over to the Old Bear at Brenton's Heath."

Well, we thought no more of the fellow at that, not till evening when Big Ben come home and Billy Hart, who was a gossiping sort, tells Big Ben as how the very spit of himself was into the Blue Lion this day.

I noticed Big Ben gave a start and his knuckles turned white where his hands rested on the table edge, but he spoke calm and steady enough.

"So," he says; "I'd like to see the lad as looks like me. What sort of a chap was he?"

Well, Billy goes on to describe him, and Big Ben turns to Bess. "What was he doin' here?" he asks her. "Did he say where he was stoppin'?"

She told him the lad was asking for a man named Tom Henley, and said he was stopping at the Old Bear at Brenton's Heath. I was watching Big Ben close, for in my ears were the stranger's words about murder and a reward, much as I tried to forget them, and I saw that Big Ben for all his calmness and his easy tones was mightily disturbed by the news. But he was not the one to give himself away, not he. "Hmm," says he; "Tom Henley, eh? Never heard of him, I haven't, but then I've not been here over long. Do any of you lads know of the man?"

A cool customer he was, no less, and even if he was all that the other lad had hinted, I couldn't feel a dislike for Big Ben. And maybe, I thought, the other had said what he had just to draw Bess and me out, and there might be nothing to it. Like as not, I thought, 'twas a bit of blackmail he was trying, for he looked the sort of bounder to be that dirty, and maybe he *did* know something of Big Ben's past that he could threaten to tell unless he was well paid to keep quiet. But what if Big Ben *did* have a bit of a shady past at that, I thought. Didn't we all have things we'd like to forget and have forgot? I'm no angel myself, I'm not, and anyhow, if Big Ben had done anything much 'twas the business of the police and of nobody else. And as for having gold to buy the Blue Lion with, well, I hadn't thought of that before, 'tis true, and I doubt if the others had, but you see we all knew he was a stranger, and coming up on the Portsmouth coach we'd taken it for granted he'd come over seas—what with his big coat and his bag and his parrot and all, and his sailorish ways—and so why shouldn't he have had good gold sovereigns? Maybe he'd come from America or maybe from some other spot where gold was plenty, and couldn't a man have a few hundred pounds of money in his pockets without being a murderer or a thief or a rascal of some sort? Howsoever, liking Big Ben as I did, and knowing him as well as the next, me being so much about and dropping in to the Blue Lion and chatting with Bess and what not, I decided 'twould do no harm to tell Big Ben a bit more of the other chap's words, so if there was anything to it all, Big Ben'd be on his guard. So I managed to get him one side and told him everything. He listened mightily intent and his face serious and then he burst into a hearty laugh.

"Thanks, Bob, thankee kindly," he says, clapping me on the back. "'Tis not many as would be as free-spoken as you, but I know 'tis because you think I should know, and I know you don't believe a blinkin' word of it. But I know the lad over to the Old Bear, I do, and I know his game and what he's after, and I can look after myself, I can. So don't worry over me, Bob, me lad, but thanks for what you've told me."

WELL, sir, that was that, and me not knowing any more than before, except that Big Ben knew the other and his game, and the matter wasn't any business of mine after that. But just the same when Nate Bronson said he'd seen a hulking big man muffled up in a cloak hanging about the Blue Lion after one in the morning—though what Nate was doing up at that hour the Lord alone knows (poaching, I expect)—I began to feel that there *was* something afoot and that the stranger from the Old Bear wasn't there for any good and peaceful reasons. In fact I had a mind to tell Big Ben about the fellow sneaking about in the middle of the night, but remembered he'd said he could take care of himself, so I didn't mention it. In fact Bess said I'd best not, and she said, too, that 'twas a kind of funny thing that ever since the other man had been there, Big Ben had kept his parrot in his bedroom, instead of in the bar-parlour.

"Maybe," I said, "it hasn't anything to do with the fellow, or again perhaps he's a rascal and a thief and Big Ben thinks he may try to steal the bird. If it's worth five hundred quid, as the American seemed to think, it's well worth lifting."

"And another thing," says Bess. "Carrie" (that was the maid at the inn) "tells me he keeps his pistols all loaded and under his pillow now," says Bess.

"So I'd do the same," says I, "if that scar-faced scoundrel had been asking about me and hinting at a past I didn't want dug up and———"

"Then he *does* know him and he's really and truly Tom Henley!" exclaimed Bess. "Golly, I wonder what he's done that there's a reward for him."

Well, of course I'd made a slip, but by now Bess and I understood each other pretty well, and I told her the whole thing and warned her to keep it to herself. "But I don't believe a thing about that reward," I said. "If the lad over to the Heath knows anything about Big Ben's past, he's just a rat of a blackmailer. Do you think he wouldn't want to grab that reward if there was one? And I shouldn't be a bit surprised if *he's* the one the police want, not Big Ben."

"Well, the next morning I was off early for Kingston, and as I drove along past Fairmile, who should I see walking along the road ahead of me but Big Ben and the stranger from the Heath. You could have knocked me over with a feather, for they looked as friendly as is, talking earnest but no high words nor excitement, and now and then laughing. I was that dumfounded I stopped the car and sat there, just looking at them, until they turned into the lane and disappeared.

But that night, as I was coming back late, it was a different story. I was pretty near to Hobham, coming in by way of Oxshott, and was passing the bit of spinney by Ockam Dean, when I heard loud voices and a curse or two from behind the hedge. Of course I didn't stop— it wasn't any of my affair and it don't pay to interfere in other folks' quarrels—but I could have sworn before any judge and jury that the voices, or one of them, was that of Big Ben and the other that of the lad with the scar on his face. And sure enough, when I dropped into the Blue Lion, Bess told me Big Ben was out, and hadn't been in since he'd gone off with his stick along about dark. Well, I hung around a bit, worried for fear there might have been trouble, for you see I'd never heard Big Ben angry or cursing before, and I knew he had that whacking heavy stick, and when a big quiet man gets mad, he gets mad all through and goes crazy like and sees red and doesn't stop to think what he is doing. And I knew if he hit out with that stick, he'd just about bash in the head of the other chap. Not that I'd have minded if he had, only I knew the police would get him if he did and there'd be the devil to pay all around, what with none of us really knowing anything about Big Ben, and the gossip there'd been about him and one thing and another. But I needn't have worried. Along about ten Big Ben came in, looking a bit flustered and red in the face and twirling his stick, but otherwise the same as usual. He drank a lot that night, he did, that is for him, who usually was a most moderate drinker, and he smoked steady and wasn't so talkative as usual. And around ten-thirty sharp he got up and shooed us all out, saying as how he was tired and was going to bed and didn't want to be disturbed and was going to close up for the night.

That was the last any of us ever saw of Big Ben alive.

First thing next morning Carrie came screaming out of the Blue Lion—she was the first one to be up, bar-

ring Big Ben—and yelling that Big Ben was dead. Of course everyone in the village—leastwise all who were up and dressed and a lot who weren't, that is weren't dressed, I mean, came on the run after Constable Haley. Bess was standing in the bar-parlour, wrapped up in some sort of a silk thing and all a-tremble and scared, but looking mighty pretty, I thought, and Jimmy the boots was shaking and scared like the others. Well, Carrie, between gasps and starts, told how she'd gone to Big Ben's room to take him his tea, and had knocked on the door, and no answer coming had peeped in, and there was Big Ben sprawled on the floor with his head all twisted to one side and dead as you please.

"Murder it is, sir!" wailed Carrie, who was old and excitable anyhow. "Oh, Lord, ha' mercy on me; but I can see his eyes now, sir. All glazed and glassy like, an' rolled up and his face as purple as a pansy, sir. Lord ha' mercy! The poor master murdered in his own pub! And such a fine, generous, good-hearted gentleman he was at that, sir! And now——"

BUT nobody paid any heed to her, for everyone was pressing after Constable Haley except me. I was trying to calm Bess, and telling her to hurry back to her room and get properly dressed, for the coroner'd be along in a jiffy and he and the police would be asking questions of all the staff, and she couldn't be sitting about before a lot of strangers with only a kimono on and her hair down and no shoes or stockings on. Well, having got her off, I followed along to have a look at Big Ben myself. Constable Haley'd covered his face with a sheet, but he lay there on the floor—nobody moving him till the coroner came, of course, and then I noticed that the cage of the parrot was empty and that the bird was dead, too, lying in a mess over by the window. I pointed this out to the constable—the rest of the crowd having gone back to talk it all over at the bar, and he nodded and said as how he knew, but the law said no *corpus delicti* could be moved until the coroner gave permission, and as how it didn't say whether only a human body was a *corpus delicti* or any body was, and as both Big Ben and the bird had been murdered, he wasn't taking any chance of being called off by the coroner, and was leaving both *corpus delictis* where he found them.

Well, sir, after a bit the coroner—who'd been called on the telephone from Kingston—came in. He was a short man with a red face and a paunch like a publican, a man named Chermondy, a Welshman I think, or maybe a Cornishman, but a jolly old boy, bald as an apple and with keen blue eyes and a funny trick of saying, "Well, well; 'pon my honor!" at everything.

So as he comes into the Blue Lion he was puffing and blowing, and the first thing he says is, "Well, well! 'Pon my honor! The man's dead. Looks like homicide, 'pon my honor, it does!"

Well, he examined Big Ben carefully and kept muttering to himself. "Choked, strangled," he says. "'Pon my honor, yes. Garrotted with a thong. Well, well!" Then he told Constable Haley to get the body on the bed and to summon all the staff of the Inn and any outsiders that had any information to gather in the bar-parlour so he could question them.

"'Ow about yon bird, your honor?" asks the constable, jerking his head toward the dead parrot. "The bird's been murdered, too, I'm thinkin', your worship."

"Tut, tut!" exclaimed the coroner. "How *can* a bird be murdered, Constable? Answer me that, sir. Murder, as you should know is, in legal parlance, homicide. Homicide is derived from the Latin *homo*, or man. Homicide means man-killing, and how could the death of a bird be homicide, or as you put it, murder? Well, well! 'Pon my word, it's amusing! A murdered parrot! 'Pon my word, that's good. Do with the thing? Why do what you please—throw it out, stuff it, eat it for all I care! 'Pon my word, yes!"

Constable Haley was red and flustered. "Did you 'ear 'im?" he exclaimed, after the coroner had waddled away. "Did you 'ear 'im sye as 'ow Hi could heat the bloomin' bird? Heat a parrot, my heye! Hand just because Hi done me duty an' never laid 'and to the *corpus delicti!* 'E's a bloomin', blinkin' blounder, 'e is!"

"If you don't mind, Haley," says I, "I'll take charge of the bird. I'm not going to eat it any more than you, but the coroner said you might stuff it, and being as I was a close friend of Big Ben here, and knowing what store he set by the bird, I'd like to have it as a remembrance of him. I'll take it over to Guildford to the taxidermist there and have it stuffed proper, and put it in a cage so it'll look as life-like as is."

"Tyke hit an' welcome," says he. "Honly never let me put my heyes hon the blinkin' thing again."

We all went into the bar-parlour, where the coroner sat with a note-book and pencil, and there, before we could get seated or begin, came the sergeant of police from Esher and the other two constables from Street Hobham and Church Hobham. Looked quite a bit like a real police-court it did, and very solemn. Of course we'd all come to the same mind by now, that is, I had, and Nate and Billy Hart and Sam Phillips and Bess and all of us who knew about the stranger over to the Old Bear. We are all as cocksure that he was the one that had killed Big Ben as we wanted to be. Who else would have done it, and why? And who else had quarreled with him? And why else had Big Ben kept his pistol under his pillow? That gave me a new idea, and I wondered why he hadn't shot whoever'd come into his room and where the pistol was. So I stepped over to Constable Haley and whispered to him about it, and he went back to Big Ben's room, and pretty soon he came back carrying the pistol and with a queer look on his face. He laid it down before the sergeant, instead of the coroner, and saluted.

"Hi found this hunder the deceased man's pillow, sir," he said. "But has you'll see for yourself, sir, hit's not loaded, sir."

"Well, well! 'Pon my word, what's this?" exclaimed the coroner. "A pistol, eh, and not loaded. Well, well! I must make a note of that."

Then he began questioning the lot of us. First, Carrie the maid, and a hard time he had of it with her, what with her wringing her hands and crying and getting excited and having to say over and over again how she'd taken up Big Ben's tea and found him dead and all. But with it all never a word that helped, as far as I could see. Then Bess, and Jimmy the porter, and myself, but no nearer to getting at the bottom of the matter; but then why should he, when we all knew, as well as we wanted to, that the stranger with the scar had done for Big Ben. 'Twas funny, I thought, that a constable hadn't been sent to arrest him, for even the coroner must have seen by now who the murderer was,

what with my story and that of Bess and of Nate and everyone, all telling of the fellow's coming over and what he'd said of Big Ben, and how I'd met them quarreling on the roadside and all.

THEN I noticed the sergeant get up and slip out of the door, very quiet like, and I thought to myself he *was* going after the stranger. But in that I was wrong, for pretty soon he comes back, and the coroner then being writing and the place quiet, he goes over and speaks to him and tells him he's been having a look at Big Ben's room. He glares at poor Constable Haley like as if he'd been a boy caught stealing apples.

"A fine credit to the police you are," he says. "Were you frightened at the corpse?" he asks, sarcastic, "or did you think a murder was a bally political meeting that you never so much as looked about for clues? No, you didn't even find those bloody fingermarks on the window-ledge and door, nor the deceased's portmanteau and bag slit open and rifled. A fine constable you are, to be sure!"

"Well, well! 'Pon my honor!" exclaimed the coroner. "What's this, sergeant? Fingermarks and bloody, you say! And the bags cut open! Important, very important. I must make a note of that. But—but, my dear sergeant, why should there be bloody fingermarks? The deceased came to his death by strangulation—there was no wound, no blood. I made a most careful examination."

"As to that I can't say, sir," replied the sergeant. "Maybe the murderer cut himself, or"—a bright idea came to him—"maybe the parrot nipped his finger, sir. No doubt he wrung the bird's neck to stop his squalling, and parrots have a nasty way of nipping, you know, sir. At all events he left bloody fingerprints, and I'd suggest, sir, we have a man from Scotland Yard down to take a look at them, sir."

"Well, well. 'Pon my word, yes, sergeant," agreed the coroner. "And no doubt, as you say, the parrot nipped the rascal's finger. Let's have a look at the bird and see if there's blood on its beak."

"Well, it was there; blood, I mean, but not on its beak so much as on its feathers about the neck; red stains on the green feathers as plain as is.

Of course that settled it. But why, I thought—and I whispered as much to Bess—didn't they send and get the scar-faced fellow before he cleared out?

But I didn't have time to say much, for now the coroner was standing up most solemn and imposing, like a judge in court—though more like a publican about to make a speech on a bank holiday—and clearing his throat and staring about at us over his spectacles.

"Hmm," says he. "I find that the deceased, Benjamin Pollard, otherwise known as 'Big Ben,' came to his death at the hands of a person or persons unknown, but that suspicion points strongly, most strongly, towards a gentleman who is or was residing at the Old Bear Inn at Brenton's Heath, and while it is not within my province or jurisdiction to do so, I suggest—in fact I advise—that the said gentleman be apprehended and placed under arrest, and that an expert be secured from Scotland Yard to aid the local police in their investigation of the lamentable tragedy that has occurred here in the Blue Lion Inn. I——"

"Beggin' your pardon, sir," says the sergeant, interrupting him. "But the bird—er, the suspected gentleman—has flown, sir. The constable I dispatched to Brenton's Heath reports that the gentleman who was known by the name of Lemuel Henley has been absent from the Old Bear since yesterday at nine o'clock of the morning, sir, at which time, sir, he was seen to step aboard a London motor-coach, sir."

"Well, well! 'Pon my honor!" exclaims the coroner. "This *is* very serious. But it merely signifies delay. He will soon be apprehended. Have you notified London that he is wanted, sergeant?"

The sergeant nodded. "Yes, sir," he says, "but——"

At this minute there are hurrying footsteps outside and the door opens and who comes rushing in but the stranger himself! Yes, sir; running straight into the lion's jaws, as you might say, and a mighty queer thing for a murderer to do, I thought, knowing, as he must have, that the police were at the Blue Lion and that he'd be the first one to be suspected of doing for Big Ben.

"My God!" he exclaims, before anyone could speak. "Is it true? Is it true that Tom—Ben—has been murdered? I saw it in the *News*, but I couldn't believe it, though often I've warned him. I——"

The sergeant was on his feet looking very stern and officious and all. "It is perfectly true," he says, "and you may consider yourself under arrest on the charge of the murder of one Benjamin Pollard, owner of the Blue Lion Inn," says he. "Constable Haley, take charge of the prisoner."

For a minute the fellow with the scar stands there, struck dumb as you might say, gaping about at us all as if not believing his ears. Then he turns redder than ever and his eyes blaze and he takes a step towards the sergeant, his head stuck forward and his big fists clenched, and for a moment I thought he was about to attack him.

"You consummate, addle-pated ass!" he spits out. "Me, *me*, the murderer! Why, you blithering idiot, do you think I'd murder my own brother?"

Well, at that we all came near fainting with the surprise. The brother of Big Ben! But we might have known it, what with him being so like Ben and all. And hadn't he asked if a Tom Henley was here? And hadn't he been registered over to the Old Bear as Lemuel Henley? 'Twas plain as the nose on your face now. But after all, that didn't prove he hadn't killed Big Ben. Many a brother's been killed by a brother, and with my own ears and eyes I'd heard and seen the two quarreling. And this Lemuel fellow'd hinted at dark things about Big Ben, that time he'd dropped into the Blue Lion.

The sergeant must have thought as much, for as soon as he'd got over his surprise at the fellow's words he says: "His brother you may be and then again you may not be, but, brother or not, you're under arrest, sir."

For a minute I thought the man would knock the sergeant down, so ugly and vicious he looked, but he saw that the sergeant was in earnest and that 'twas a serious matter, and suddenly he threw back his big head and laughed.

"I suppose it's your duty, sergeant," he says. "But it's an ill welcome for me who came here post-haste at word of my brother's death to be nailed for killing him, when since yesterday noon I've been in London to an hour ago." Then, in another tone: "May I see the—my brother's body?" he asks. The sergeant turned to

the coroner, a questioning look on his face, but the coroner nodded. "Well, well! 'Pon my honor, of course; why not?" says he; then:

"But watch your prisoner carefully, sergeant. He appears to be a desperate character."

Well, sir, there's no earthly use going over all that took place for a time after that. Big Ben was buried, and a fine funeral he had, too, with flowers and a silver-trimmed coffin and plumes on the hearse and all, and everyone in the village out to follow to the grave. Yes, and even the man accused of murdering him was allowed to attend the services, though guarded by two constables at that. And I must say he looked as sad and sorrowful as any.

THE chap from Scotland Yard came down to Hobham, too, a slim young chap, looking more like one of the swells from the West End than a policeman, but a nice-spoken chap, although having a bit too much to say to Bess to suit me, though she turned up her nose at him, I must say. He fussed around a bit—mostly in Ben's room, that had been kept under lock and seal since the murder, the Blue Lion being closed down, with Carrie out of a job and Bess at the White Hart and Jimmy, the boots, gone to London or somewhere. Yes, everything set at topsy-turvy over Big Ben's death, and his fine pub idle, for you see he hadn't left a will, or at least no will had been found, and the place would have to be sold up, only the prisoner, claiming to be Big Ben's brother and next of kin, if he proved he was, the Blue Lion would go to him, though what use 'twould be, if he was found guilty and was hanged, I couldn't see.

But as I was saying, the lad from Scotland Yard came down and went back again and what he found or didn't find I don't know. Neither do I know all that went on at the hearing of the case of the man with the scar, Henley.

Bess and Carrie and I and the others all had to appear again, though we only told the same stories again as we'd told the coroner, and a great waste of time I thought it. But some of the case I heard and more I read in the *News* and more I was told by Constable Haley and others and most of all by young Roger Keats, the barrister. Well, sir, the chap from Scotland Yard testified as how the blood stains on the window ledge and the door weren't blood at all, nor were the red stains on the bird that I'd had right properly stuffed by the taxidermist at Guildford and that was brought in—the bird, I mean—as evidence, and which everyone said was as lifelike and natural as is, and you'd almost expect to hear him croak or squawk. And moreover, the police admitted that the fingermarks on the window ledge weren't those of the prisoner, and a doctor who'd been called in swore as to how there wasn't as much as a prick or a scratch on his fingers or body anywhere. So there they were with that evidence gone west, as you might say. And he—the prisoner, I mean—had letters posted in Hobham and dated from the Blue Lion Inn, and others from elsewhere, in Big Ben's writing, calling the man "Dear Brother Lem" and signed Tom. And finally the fellow had half a dozen or more witnesses who all swore to it that this man, Lemuel Henley, was in London all the day and the night when Big Ben had been murdered, and didn't leave till the morning when he heard of the matter. So they couldn't find a true bill and discharged him. Then he did a queer thing—and what I thought was a fine, brave thing for any man to do. And he wasn't called upon to do it at that, as you'll see, and it might have got him into a bad fix and into gaol at that. He stood up in the court and he thanks the gentlemen for their fairness and their verdict. Then he says he intends to find the murderer of his brother, come what may, and he goes on to ask why no one has taken the trouble to find out what it was that his brother had kept locked in his bags, and why Big Ben had gone so often to London. What, he asks, was the motive for the murder? Robbery, of course, he says. Who but himself could have known what was in the bags? he asks. And why? he asks the court, did his brother go under the name of Benjamin Pollard when his real name was Tom Henley?

Well, sir, this *does* make a stir. You see, they'd been busy trying to find a true bill against *him*, and they'd not thought of others. They were that sure he was the right man; and now he'd sprung his letters and his alibi and all. So they were all at sea, as I might say, and didn't know which way to turn, so all they could do was to ask the man they'd accused of murder to tell them what he knew about Big Ben's bags and one thing and another. And though he had no cause to do so—and so Roger Keats, who knows the law from A to Zed, says—the law couldn't have forced him to say anything that might incriminate himself, he tells everything. And a fine, amazing story that would do for a six-penny thriller it was at that.

The two brothers had been sailors, Big Ben having been master and Lemuel mate, and trading in foreign parts, mostly on the coast of Africa. Then one day they get some diamonds from a native, and thinking maybe there was a new field thereabouts, they went into the country, and in Basutoland they find the stones as thick as thorns on a gorse bush. But before they got off, the government claps the lid on the pot, as you might say, making it law that no one can get diamonds in there, and neither can they take them out.

So there they were in a nice pickle, to be sure, the two brothers without a farthing to their names, their ship on the coast waiting, and their wallets full of stones that they'd spent every penny and all their time getting, and the law saying they weren't theirs and liable to be arrested and clapped into gaol if they were found out. Well, sir, they were good British citizens and honest seamen and respected the law, but that was too much. So they made up their mind to separate and so have a better chance, and to head for the coast, each from another direction.

But Lemuel didn't make it. The constabulary got him; he had the stones, and though he'd got them all before the new law was put on into the gaol he went. But the worst of it was he didn't know whether Brother Tom had got clear or not. Not until he got free from gaol, he didn't, and then he learned the ship had sailed away and Tom on it and left him with never a word or a shilling, he hadn't. You couldn't blame him overmuch if he thought bad of his brother at that. And when he'd worked his way to England, and found Tom had left the ship at Portsmouth, and traced him up to Hobham, where he was going by the name of Ben Pollard, and had bought the Blue Lion and all, why, who could blame him if he thought his brother had tried to give him the slip and do him?

LIKE as not I or anyone else would have felt the same. But when he met Big Ben and had a chat, though heated a bit the words were, he admitted, and Ben told him as how he'd been afraid he'd be nabbed and hadn't dared write, and that Lemuel's half of what he had was safe and waiting, why then they got friendly as ever again. And it was diamonds that Big Ben kept in his black bag, and to sell the stones, a few at a time, that he'd been going so frequent to London for. So, whoever'd killed Ben must have known of what he had, said Lemuel, and it wouldn't be hard to find out who sold stones that hadn't paid duty at that, providing the murderer sold them in England, and that didn't seem likely to me. Well, as I said, Lemuel might have got himself into trouble by his story, but he didn't, for he'd served his bit for getting the diamonds in Africa; he'd brought none in, and though Big Ben could have been jugged for smuggling in the stones, yet being as he was beyond reach of the law, why there wasn't much that could be done, only to order the strong box that Big Ben had rented in London to be opened and any stones that were in it confiscated by the Crown.

Well, sir, that was done, but never a diamond could be found. Only a lot of letters and papers and bank-books and such, and ten thousand pounds in notes. And among the papers Big Ben's will, which was the most amazing thing of all, when I heard of it. All the cash on hand and personal property of Big Ben was left to his brother, Lemuel, and then it went on to say that he willed the Blue Lion Inn with its furnishings, fixtures, stock-in-trade, good will and interests to Bess and me, provided we were proper married.

Well, you could have bowled me and Bess over with a feather, as you might say. All we'd been waiting for was to lay by a tidy bit for a rainy day, and here we were with a fine pub and all. So we were married the next day and that's how I come to own the Blue Lion, and a right neat living it's brought us these many years. But with ever and all, and Lemuel well fixed for life—and a right decent chap we found him after all our misjudging him, aye, none better—nobody was any nearer to finding who'd done for poor Big Ben, and only Lemuel and Bess and myself much interested in getting at the bottom of the mystery at that.

Then one day, as we were tidying up and getting the Blue Lion into shape for business—Bess and I having got back from a honeymoon down to Folkstone—who should pop in on us but the American professor chap who'd been so excited over the green parrot the year before. Yes, sir, there he was again, goggles and plus-fours and all.

"Ha!" says he, beaming all over. "Still here, I see. And here I am, back again." All the time his eyes were glancing this way and that, as if looking for something. "Gracious, yes!" he says. "Here I am again, but I don't see that most remarkable bird. Do you know," he goes on, "I've come all the way from America to this place solely for the purpose of seeing that bird, and if possible endeavoring to induce its owner to part with it? I'm prepared to pay anything in reason if——"

"Then I'm afraid you've had your trouble for nothing, sir," I tells him. "The owner's dead, sir, murdered he was in this very inn, and the bird as well——"

"Goodness gracious!" he exclaims. "What a dire calamity! What a tragedy! But I hope that the body was preserved and not cast away," he says, meaning, I took it, the body of the green parrot and not Big Ben's.

I nodded. "Yes, sir," I tells him. "I saw to that, sir. Big Ben always took great store by the bird, and I had him properly stuffed, by the taxidermist at Guildford, sir, and a fine job he made of it at that. But why Big Ben thought so much of it or why you're so anxious about it is more than I can see, for to me it's no better than any other green parrot, and it's only for memory of Ben that I paid for having it stuffed as I did, sir."

"Parrot!" he cried, jumping up and throwing out his hands like he was swimming. "Parrot! Oh my sacred aunt! Parrot indeed! Why, goodness gracious, the bird was not a parrot. It was a species of touraco—a rare, an exceedingly rare bird of African origin. And a *most* remarkable bird. Perhaps in some ways *the* most remarkable bird, for it's the only bird in the world whose feathers are actually green but actually contain red pigment. And this was a unique specimen, a specimen in captivity. However," he sighed, "better half a loaf than no bread. Would you care to—er—dispose of the specimen?"

"Hmm," says I, as Bess kicks my shins and nods and winks at me. "So it wasn't a parrot after all. And most likely Big Ben knew what he was talking of when he'd say 'twas a remarkable bird, perhaps *the* most remarkable bird. But as to selling it, well, I don't know as to that, sir. Bess and I set a lot of store by it, seeing as how Ben thought so much of the bird and as how he left us this pub and all. But then——"

"Of course, of course!" he interrupts me. "But consider that you are really doing a great deal for science if you dispose of the specimen to me. Here in this inn it will become dusty, moth-eaten and will be eventually thrown in the rubbish, while in a great museum, with your—er—name upon it, it will be preserved indefinitely and of benefit to the public. I am——"

"I'm not a rich man, sir," I told him, without waiting for him to finish, "but I have a good income and somehow I don't like the idea of selling the bird, as Big Ben wouldn't listen to selling it when he was alive. But if the bird's to go to a museum, then take it and welcome, I say, for nothing could suit Big Ben better than that, I am sure, sir."

Well, I never before heard and I never expect again to hear such thanks as the Professor—Judson his name was—gave Bess and me for that stuffed green bird of Big Ben's. And what with one thing and another, and him asking many a question, I told him the whole story of the murder and of the trial of Lemuel and all. He was right interested in it all, and a sharper chap I never met, no, not even Roger Keats, what with the things he picked to seize on and ask about and all.

"Blood! Of course it was not blood," he declared, when I told him about the fingerprints. "But it might as well have been. And whoever left those marks was the murderer, of course. And the pistol, not loaded! Did nobody ever ask about that?" says he.

"Not that I know of," I tells him. "It hadn't been fired and Big Ben hadn't been shot, so it didn't seem to have much to do with the matter."

Professor Judson snorted fit to give one a start. "Fools!" he most yells. "Fools, like the police everywhere. Why, goodness gracious, man alive, that unloaded pistol has everything to do with it. Where does this Mr. Lemuel Henley live? And where is this law-

yer—no, barrister I believe they are called over here—friend of yours have his office? Get them both and we'll have a talk and I'll wager we find the murderer soon.

WELL, it didn't take long to get Lemuel and Roger Keats to the Blue Lion when they heard about what Professor Judson had said. And all of us went into the back room—the same as Big Ben used to use for himself and his cronies when many folks were about in the bar-parlour—and there we sat listening to what the Professor from America had to say.

In the first place, he pointed out, the unloaded pistol proved the murderer was someone who had access to the inn and Big Ben's room. "Do you suppose for one minute," he asks, "that Big Ben, as you call him, would have bothered placing an empty gun under his pillow? Of course not! And didn't the maid report that he always kept a *loaded* gun there? Hence," he continues, "we must assume that he feared robbers or perhaps enemies might attack him or attempt to rob him, and that on the night in question he believed that he had a loaded weapon within reach. In other words, sirs, the person who plotted to rob, and if necessary murder him, knew that a loaded gun was always under the pillow, and to avoid all chances of being shot or of having the neighborhood aroused by the sound of a shot, he removed the cartridges from the pistol and replaced it empty and harmless. That much, gentlemen, we may assume is as well established as though proven in a court of law. But who was the person?

"No doubt, had the weapon been carefully examined for fingerprints when first found, the identity of the murderer could have been established, for beyond any doubt in my mind it was some employee of the inn or some one who was stopping here that night——"

"There were no guests that night," I told him. "And as for the murderer being one of the staff, that's unthinkable, Professor," I says, a bit hotly.

"Tut, tut," he says, smiling at me condescendingly sort of. "I'm accusing no one, but I *am* attempting to solve this murder mystery by the means of deduction. Now we have deduced that the murderer extracted the charges from the pistol. Hence we may deduce it was someone who had access to the room and was familar with the habits of his victim. I——"

"I don't agree with you," says Lemuel. "I admit I expect you're right about the reason for the pistol being unloaded, but I don't see any reason why a body shouldn't have come in from outside and have done it. He didn't have to know my brother's habits at that. He might have been looking about and found the pistol by chance. He——"

"True, quite true!" interrupted the professor. "In fact we have excellent evidence of the fact that the murderer *did* enter or leave by way of the window, but he would hardly have been able to enter unseen during the day, and if he had entered and had remained in the room, the bird would, in all probability, have squawked and betrayed his presence, for I understand that the creature invariably exhibited dislike of strangers by uttering its customary raucous notes. That, gentlemen, is one reason I unhesitatingly declare that the murderer was someone well known to the bird."

"You're forgetting the bird was killed," says Roger Keats. "No doubt he killed it to prevent it from giving warning of his presence."

The Professor snorted again. "And you are forgetting that the bird was killed *after* the murder was committed," he said. "Do you imagine that the owner, who prized the bird so highly as to refuse an offer of five hundred pounds for it, would not have noticed that his pet was killed——"

"Might have been killed while he was asleep," suggested Roger.

Professor Judson smiled. "But you told me he was fully dressed," he reminded us. "Though," he added, "I do not deny he may have been sleeping. But even so, it is inconceivable that the bird should have been dragged from its cage and strangled without uttering a cry, and what is more, I am prepared to prove, by irrefutable scientific facts and evidence, that the murder *was* committed before the bird was killed."

"Even if such proof is possible and admissible, I cannot see that it brings us any nearer to the solution of the mystery," said Roger Keats. "Whether the bird was killed first or whether the murder was committed first has no direct bearing on the case."

"Indeed?" says the professor. "In that you are greatly mistaken, Mr. Keats. It has a very great bearing on the solution, in my opinion. It establishes the fact, almost beyond question, that the murderer was recognized by the bird, and what is more, I am prepared to prove in any court that the murderer committed his crime, and finding it impossible to open the bags in search of the diamonds, left the room and returned, and not until then killed the bird for fear it might give an alarm while he was rifling the murdered man's possessions."

"If you could do that," said Lemuel, "then you're no Professor; you're a wizard. I've seen many a trick of magic by those fakirs out East, but not one of 'em could turn the trick you say you can do."

"Not a bit of magic about it," declared the professor. "But let me ask a question. Was it not raining that night?"

I STOPPED to think for a moment. "Yes," I said. "It was a clear evening, but it must have rained during the night, for everything was sopping wet next morning. I mind that when I ran after Carrie to the inn here, the street was all puddles."

Professor Judson grinned. "I knew it," he declared, "and if we can determine the time at which rain fell, we can determine the time when the murder was committed, or rather the time when the murderer left the room and later returned to it. But the most important matter is to learn the identity of the murderer, and the fingermarks he left upon the window-ledge are, I should say, our best clue to that."

"We can't take fingerprints of every blessed person in England," says Lemuel, "and what's more, whoever 'twas is most likely out of England long ago."

"Goodness gracious, of course not!" says the professor, "but the chances are ten to one the man who committed this crime is no novice and has committed others. No doubt Scotland Yard could find his fingerprints in their files. I'm surprised, amazed, that they have not already done so."

"I'm not," says Roger Keats. "Soon as it was proved the prints were not made with blood and didn't belong to friend Lemuel here, they didn't have any bearing on the case."

"My, my, my!" exclaimed the professor. "I should have thought they did; indeed I should. But of course, not realizing what the red marks were, they would not have regarded them as important as I do. But you see, Mr. Keats, even if the red marks were *not* blood, they amounted to the same thing, for only the man who killed the bird could have left them and only the man who murdered Mr. Henley could have or would have killed the bird. In fact, gentlemen, this bird is most remarkable in more ways than one, and in this case it will be found that the bird proved a most excellent, and I might say, providential witness—an actual detective, I might say."

"It's all Greek to me," grunted Lemuel. "You're telling us a lot of things without telling us anything. And what the bally old bird has to do with it is beyond me."

"All in good time, all in good time," smiled the professor. "I dearly love a little mystery, so do let me enjoy it. And I suggest now that we secure a snapshot of the fingerprints and make a visit to Scotland Yard and endeavor to identify them."

Well, that's just what we did, me going along, too, and leaving Bess that full of curiosity as to what 'twas all about she was fair on needles and pins.

So we went up to London and Scotland Yard and everyone seemed to know Professor Judson, even if he was an American, and we found the chap who'd been down to the Blue Lion and who'd taken the fingerprints and all. But he wasn't much interested, and when he told the professor that he'd gone over every fingerprint on file and not one of them was the same as those from Ben's room, even the professor seemed a bit knocked about. But he was a tenacious chap, was the professor, and once he set himself to an idea he stuck to it like all scientific chaps do, they tell me, and nothing would do him but he must have a look himself. While the young chap was getting out the files, we were looking about, there being a lot of bills with pictures of men wanted and fingerprints and such stuck around, and pretty soon I heard the professor say "Goodness gracious!" and I turned about and there he was staring at a paper on the desk as if he'd found another of the green birds there.

"Goodness gracious!" he exclaims a second time. "Whose are these fingerprints?" he asks the young chap, pointing at the paper. The young fellow looked at them casually. "Oh," says he, "those have just come in. They're from a bird they hooked over in Notting Hill. He was with another in a stolen motor car, but swore he had nothing to do with it, so the police sent over the prints to see if we had him on record here. But we haven't. I expect they'll turn him loose if they haven't done so already. But why do you ask?"

"Because," snaps the professor, "that man is the murderer of the erstwhile owner of the Blue Lion!"

"What!" jerks out the young chap, jumping up like he had sat on a tack. Then he grabs the prints taken from Ben's room, puts them beside the others and squints at them through a reading-glass.

"By gad, you're right!" says he, seizing the telephone. "Now, who the devil is the fellow? Good Lord, I hope they've still got him."

Then, after a few words and orders over the telephone: "He's safe," he says, hanging the instrument up. "What do you say if we go have a look at him?" So off we went to Notting Hill and into the gaol and down to a cell with a man sitting inside. He turns around as we look in and I see his face.

"My God, Jimmy!" says I.

And so 'twas. Jimmy the boots!

WELL, to make a long story short, of course he was up for a hearing and of course he swore he'd nothing to do with it. He even accounted for his fingerprints, saying as how, being in and out of the room often, he'd messed some red on his fingers the day afore the murder and had meant to clean up where he left the marks but was that upset by Ben's death and all that he clear forgot it. His barrister demanded he be set free, saying as how there was no evidence against him and only the flimsy charges of an alien and a scientist with an imagination who'd imagined himself an amateur Sherlock Holmes. But he didn't know Professor Judson; not him, he didn't.

So when Roger Keats got up, all primed with questions written down by the professor, he turns to Jimmy and says he, "Will you be good enough to state why you left the room after the murder was committed and before the bird was killed?"

I could see Jimmy turn pale at that, but he swore he'd never been in the room.

"And why was it necessary to destroy the bird, by wringing its neck?" asked Roger Keats.

Jimmy twisted a bit, but he swore he knew nothing of the matter.

"But," persisted the barrister, "you must have noticed that it had begun to rain while you went for the knife. You got quite wet, did you not? And who did you hear or think you heard that prevented you from leaving by the door rather than go out a second time in the rain? You must have heard something that caused you to go out by the window after all."

Well, with that Jimmy collapsed. He was a ratty sort anyhow, a sly little cockney, but no backbone to him, and he knew Roger Keats had him cornered.

He confessed everything and was tried and convicted, but he was never hanged. He died in prison, being as much scared to death as anything, I expect, and he vowed to the last he'd never got a stone or as much as a gold sovereign for murdering poor Big Ben.

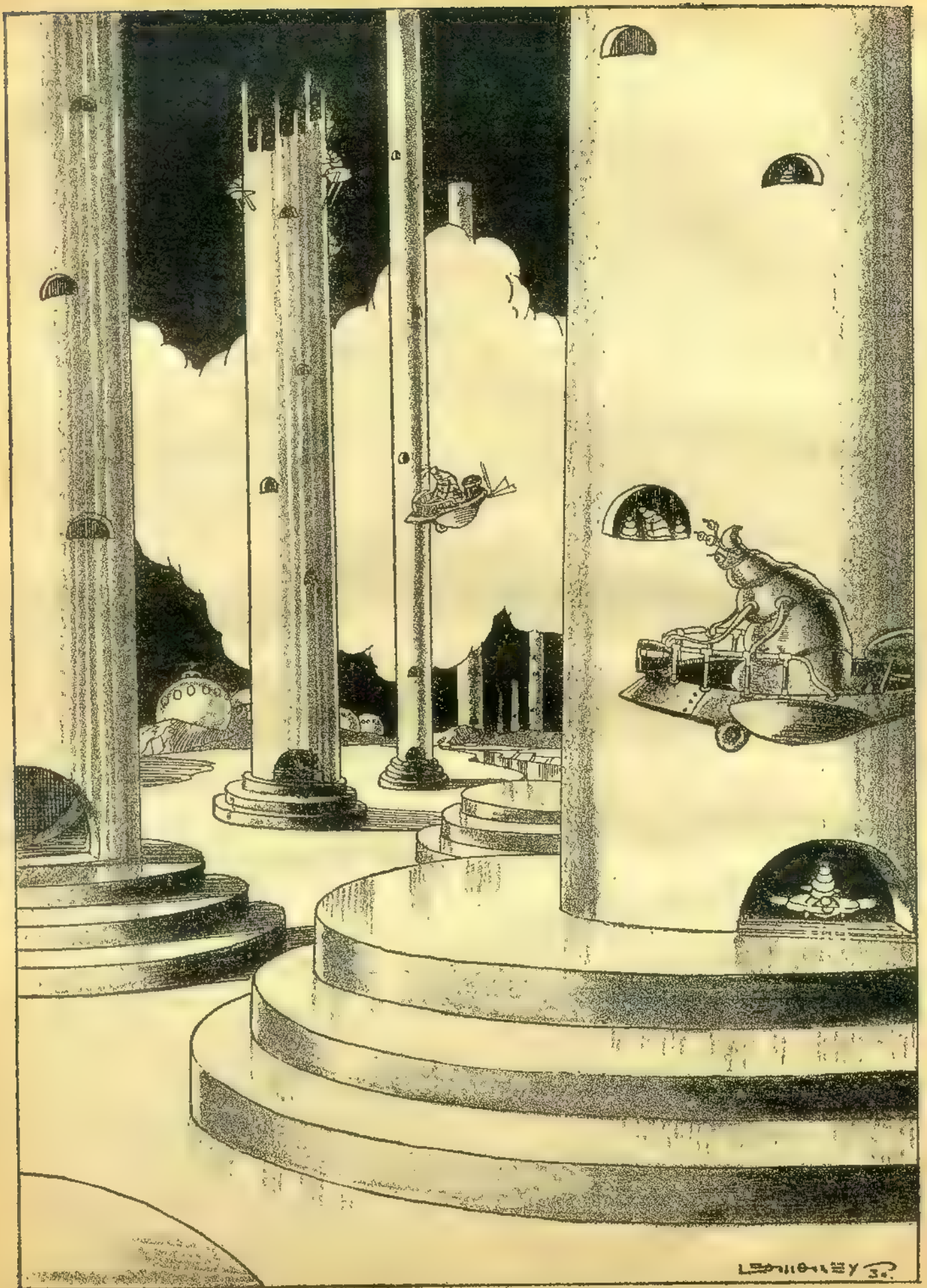
But what puzzled me and Lemuel and Roger Keats and the rest was how the professor knew about Jimmy leaving the room and it raining, and him waiting at the door and being scared and going out the window and all.

The professor grinned when we asked him.

"Goodness gracious!" he said. "It was very simple indeed. You see, as I have already told you, the bird is a most remarkable one. Not only do its feathers contain green pigment, but that pigment is more or less fugitive. In other words, it 'runs' when wet, but instead of 'running' as a green color, it turns to red. The moment I saw the stuffed bird with the red stains on its feathers I knew that the man who had throttled it had to do so with wet hands. I also knew that it must have been his fingers and hands that had left the red stains on the window-ledge and door.

"It was quite obvious also that the murder had been committed *before* the bird had been killed, otherwise there would have been red marks on the murdered man's throat or clothing or on the cord that had been used to strangle him. Why, I asked myself, had the murderer's hands been wet? Why were there red

(*Continued on page* 82)



A concrete picture of what their unthinkably remote homeland must be like began to take form

The Conquest *of the* Earth

By Isaac R. Nathanson

SINCE the dawn of man's advent on the earth, he has cut down and eliminated everything—animate or inanimate—that interfered in any way with his safe progress. Rarely did he hesitate in his cruelties, for was man not a superior being? Was he not possessed of the highest intelligence and ruling power? If conditions became reversed—if, for instance, a vastly superior intelligence, in a form entirely different from the human, were suddenly landed in our midst, it is quite probable that it would take man a long while to realize what it was all about. This story, although written by an author new to AMAZING STORIES, *reads like the work of an old favorite. It is an exceedingly ingenious tale, dealing with the nebula of Andromeda, the science of which has apparently been carefully checked back. We know you will be glad to know there are more stories by Mr. Nathanson coming soon.*

Illustrated by MOREY

IN ALL the long tortuous climb of mankind, from the time when man was but a savage brute to the high tide of civilization of the Twentieth Century, never before was there such great widespread prosperity. It is true, here and there, in this part of the world and that, poverty reared its ugly head. Misery and want, the innumerable indignities of life—even insecurity, still existed, often side by side with immense power and wealth. But taken as a whole, the world in the middle of the Twentieth Century presented a picture of general prosperity far surpassing any period that went before.

Truly man had become like unto the gods. With consummate skill and marvelous ingenuity the materials of the entire earth were called upon to minister to every want of mankind—nay, even every whim. Vast industries, linked by almost instantaneous means of communication, covered with a busy network every continent. Men of learning, the probers after the new and the untried, were steadily adding to the wealth and resources of the whole world. Everything on the face of the earth, under its surface, in the water, in the very air, was subject to man's will. And even with things beyond this earth patient men sat hungrily scanning the shining orbs of immensely far away suns and possible worlds.

One of the great tragedies of this upward surging civilization's forces has been the fate of the subject living things of the earth. Side by side with man's greatness, his material wealth, stalked cruelty and want. That has been the great blot, the reproach upon the character of mankind. No pity has been shown the weaker forms of life. Thoughtlessly, cruelly, needlessly, many harmless interesting, even useful, creatures have been exterminated utterly. And the weaker brothers of man—they, too, have not always been handled with gentleness.

In the time of which we write, although there were many signs that the world was indeed growing better, mankind as a whole, particularly they who sat in the seats of the mighty, was drunk with power and surfeited with luxury. The comforts of life were everywhere; fine homes were common, and gilded palaces, public and private, dotted the globe. The very taking of food had almost lost its original purpose and become nigh unto a ceremony, elaborate in its ritual. For many idle hands and idle minds, with more than was good for them, waxed foolish with their petty comings and goings—and many sinned mightily.

Thus, after a long age-old struggle, a creature called Man sat on high; and at his behest moved and changed and used this planet as he saw fit—truly lord of creation.

THE inauguration of a president of The United States was going on. It was a chilly day on March 4, 1937; the sky was overcast with dull clouds, and a slight

drizzle was coming down steadily. Washington was bedecked with flags and gay colors; and the multitude patiently stood at every available vantage point bravely enduring the discomfort of the inclement weather in order to view the inauguration ceremony. In spite of the weather the spirit of festival was in the air; the entire capital was gay and holiday-bent. Foremost citizens and leaders in all walks of life from all over the nation, diplomats and representatives from every land on earth were there on this auspicious occasion—nay, lent color and dignity by their very presence. Something of this spirit was even wafted on the instantaneous wings of the radio to the far corners of the world. No more impressive scene than this can be imagined than this symbol of the glorious sovereignty of a great people, this visible splendor of a mighty, prosperous and peaceful nation.

The swearing in of the new president had just been completed. The vast crowds which had been viewing the ceremony, listening in by means of numerous amplifiers, were commencing to move about; when suddenly, like the proverbial thunderclap out of a clear sky, an immensely large globe appeared immediately over the Capitol grounds. It dropped down on the plaza right in front of the inauguration platform; and in settling rapidly — yet apparently under control — barely missed crushing the life out of hundreds of people who were moving about. There was a loud commotion and mad scramble to get out of the way.

Great was the excitement and curiosity aroused all over the city. News of the strange happening quickly found its way over radio and news column. Even the inaugural parade, about to begin, and recorded as the most splendid in history, was forgotten by many.

And no wonder. It was no little thing which had so unexpectedly landed right in the midst of all these festivities at the very steps of the nation's Capitol; it was an extremely large globe over three hundred feet in diameter, of a silvery white metal and highly polished.

The first fleeting impression created on all observers was that a solid globe of metal had come down. But, no. After the first shock of surprise this impression was quickly dispelled by the orderly appearance of the huge body, and its rapid but perfectly controlled landing; what had seemed a solid sphere was now seen to be pierced with rows of symmetrically spaced circular windows. Besides, the distinct whirring and throbbing of mighty engines could be heard. There it stood, shimmering in the sunlight which by now had burst through the clouds—a thing of beauty to behold. Its weight, however, must have been enormous, for the bottom of the sphere, which on closer observation was slightly flattened, settled slowly through the pavements and surrounding ground.

Astonishment soon gave way to impatience, and then to anger. The huge globe obstructed everything in its path. For a long time it gave not the slightest sign of life, although everybody around waited impatiently for its occupants to emerge. That it was an aerial vehicle of some sort—of that there could be no doubt. The police on duty forced their way through the densely packed mob to obtain the identity of the parties in the vehicle, and upbraid them for their temerity and bad judgment in landing in such a place and on such an occasion.

But here was a dilemma indeed; there was no point of entrance and no one appeared from the inside to whom orders might be given, or of whom questions might be asked. The crowds in ever-increasing numbers milled around and around rendering the police utterly helpless. It was all very interesting, but also highly exasperating. And the huge size and weight of the object rendered immediate removal out of the question. The police stood around in perplexity.

Naturally there was much speculation as to what and where this strange vehicle came from, and to whom it belonged; for here was evidently a new mode of aerial transportation, unguessed and unheard of. All this speculation was natural and aroused great admiration and curiosity; but there was also great irritation with the pilots, whoever they were, as to their manner of arrival —a fine place indeed to choose for a landing! Life and limb was saved by a miracle. It was assumed, of course, that they came from some foreign country, as it would have been almost impossible to construct—much less fly—a vehicle of that kind in this country without it having been widely known and heralded in advance.

It was not long thereafter, however, when signs of life in the huge sphere commenced to take place. Interest became intense. Some of the circular windows began to open inward with a screwing movement; parts of the surface seemed to detach themselves and formed into platforms, and openings appeared disclosing some of the interior. The crowds became uncontrollable, and surged forward expectantly. Still no sign of a human being appeared.

Just as the officials of law and order were discussing ways and means of forcible entry, a number of strange looking objects appeared in one of the openings, then took to the air in slow circular flights around the globe; finally settling on a large platform which extended about ten feet from the ground. These small flying contrivances—for such they were—disk-like in shape, were about three feet in diameter; and on top of each, guiding it, was a strange looking creature. It was hard to determine which was the animate, and where the purely mechanical part of the contrivance began.

The police finally managed to rope off a space surrounding the globe; and forthwith a number of these strange beings, or whatever they were, settled to the ground where they were seen to better advantage. A closer view was positively electric in its effect on the observer. On top of each of the before mentioned flying disks, in a sort of hollow formed therein, sat, or stood, or lay—it was impossible to determine which—a being of the most beautiful appearance imaginable. The body had about it something of the appearance of a big beautiful sea shell, was somewhat conical in shape, the upper part convoluting gracefully; and at its dull apex, which leaned slightly forward, were three bright gray eyes. The rounded sides showed three arm-like members, slim and supple, which were endowed with a number of delicate tenacula; these members they seemed able to extend or withdraw into their bodies at will. The whole body pulsed and shimmered, and was of a beautiful iridescent color. Their average weight was perhaps about one hundred and fifty pounds. They wore various small pouches suspended by silken cords, which were fashioned of flexible metallic-like material; from these they extracted a number of queer articles, some of which were very much like writing pads and pencils. That these creatures, strange in form yet elegant to behold, were no mere animated things, but possessed of high intelligence, was clearly evident.

When night came on the mysterious globe scintillated

with myriads of lights, which shone from its numerous round openings. Numbers of these queer beings flew hither and thither about the city in their little flying machines, small but powerful searchlights flashing; evidently examining and studying what they could, while all night long immense throngs crowded around the Capitol grounds seeking to get as close as the police lines permitted. It was all very mystifying.

THE strange thrilling truth at last dawned on everybody; the scarcely believable truth, that in some miraculous manner strange living things, not of this earth, were here before them—living, thinking, tool-using beings, perhaps just as surprised at seeing us as we were to see them. The thing was incredible, unreal, beyond belief.

For ages man and his forbears had always dealt with life and the things of this earth, and beyond the academic interest of astronomers, pursued his activities as if his planet were the only one really existing—the shining stars but ornaments for his edification. But here for the first time man was brought face to face, as it were, with the outside universe. What at first was thought to be foreign visitors in a new idea of aviation, turned out to be visitors from another world in outer space. The mighty repercussion of interest aroused by such an event beggars description. It was like the first thrill of a million Lindberghs multiplied a thousand fold.

Great screaming headlines appeared in all the newspapers about "other world visitors," "Mars" and "Venus." Long columns were written about the various planets of the Solar System, including a great deal that was speculation, particularly about the "Martians," and their supposedly older and higher civilization. Overnight astronomical subjects became the leading topic of conversation.

What was to be done? Officials racked their heads as to the proper procedure. For one thing, no one knew how best to approach the queer visitors, nor how to establish intercommunication. Even with the most alien of humans one knows what to do—the need of creature comforts, shelter, food; but these beings who had so unexpectedly introduced themselves into our midst were so bewilderingly different, so utterly unlike anything imagined. Somehow it had always been taken for granted—naively so—even in most tales dealing with imaginary life on other planets, that if thinking beings existed thereon they most likely possessed characteristics of a human mold. The natural viewpoint of man makes it hard to conceive otherwise. To be sure, after the true nature of our guests was recognized, it was greatly desired to accord them the welcome they deserved, to extend to them every comfort and courtesy—befitting this amazing event. But there was no end to take hold of.

It was finally decided on a committee to formally welcome our astonishing visitors from another world. Prominent among the welcoming delegation were: Secretary of State George B. Staddard; ranking Republican Senator T. Jarvis Smith; Speaker of the House, Congressman Willis H. Haynes; Dr. Spencer Adams, of The Smithsonian Institution; Dr. James C. Goodson, of The United States Naval Observatory; Professor Russel H. Hedges, the eminent astronomer; Professor Hiram G. Daniells, eminent biologist; Dr. Ernest W. Porter, president of the Washington Academy of Sciences; and others.

Accordingly, the next morning at ten o'clock, our distinguished delegation approached the large platform extending from the globe, facing the Capitol, where a large number of the strangers were gathered. They had with them large scale charts of the Solar System and stellar constellations; and by graphic means endeavored to converse with the celestial visitors.

That they evidently understood our meaning was immediately obvious; for one of them who seemed to be the leader waved a wand-like staff and at once a large easel-like stand was brought from within the sphere. This stand was covered with white material; and the leader, taking a pencil from one of his pouches, rapidly and skilfully sketched a sidereal chart of the heavens as viewed from our Solar System. Then, pointing to a spiral nebula in the northern constellations, he made an enlarged drawing of it, laid his wand on one of the stars of which it was composed, and made it perfectly plain that the visitors came from that spot in space.

This nebula to which he pointed, was recognized as the Great Nebula of Andromeda, designated in astronomical catalogues as N. G. C. 223. It is one of the hundreds of thousands of extra-galactic nebulæ scattered in far off space. A number of the spiral nebulæ had at last been resolved in our largest telescopes, and are definitely placed by leading astronomical authorities as way and beyond the uttermost limits of our Sidereal Universe; in fact are distinct and entirely separate universes, immeasurably farther than the most remote star in our Milky Way.

The Great Nebula of Andromeda, from which our visitors had so dramatically come, is distant about a million light-years from our Solar System. Visible to the naked eye as a hazy star of the fourth magnitude, viewed through a large telescope it is one of the most magnificent objects in the heavens. It is the largest known of any of the spiral nebulæ, and is in reality an incomprehensibly vast system composed of hundreds of millions of stars, similar in size and physical structure to those of our own universe. The whole system is so remote that its individual stars are indistinguishable except by the largest telescopes.

After further efforts it was learned that the home of our visitors was a small planet approximately the size of our Earth, revolving about a star somewhat larger than the Sun. This was all the information it was possible to get at the time from the celestial voyagers, due to the great difficulty of a mutual medium of understanding. It was only by means of astronomical charts and descriptive drawings on both sides that the above information could be gleaned.

Words cannot describe the tremendous sensation this caused throughout the entire world. It crowded everything off the front pages of newspapers altogether. In fact, so strange and so unbelievable was all this, as to cause a feeling of doubt to persist in many of the best informed quarters. Eminent savants in Germany, France and other countries wrote learned treatises relative to the subject, analyzing the possible from the impossible. There was even a widespread feeling that some gigantic hoax had been perpetrated.

For one thing, how could anything within any conceivable lifetime succeed in bridging the vast unthinkable distances separating our mite of a world from this outside universe? According to our knowledge the speed of light is the fastest possible speed in the universe. And a

simple calculation sufficed to prove, though fast as light is, traveling with the inconceivable speed of over one hundred and eighty-six thousand miles a second, this enormous speed is but a snail's pace, when it comes to interstellar distances. How, then, could this strange craft ever have bridged a distance which takes light itself the unthinkable time of one million years to span. It seemed preposterous.

And yet, here was stark truth in evidence. Outside of the human species there was no other born of this earth capable of such high powers of thinking and co-ordinated activities. The extra-mundane derivation of these strangely formed beautiful beings could not be doubted by all those who saw them. They seemed unable to move about without their small mechanical vehicles, which responded to their every touch; on the ground, up or down, in any direction—at least no one saw them apart. These vehicles were of the same metallic substance as that of the huge sphere, and they moved about in them with scarcly a sound, with no more effort than we do in our clothes.

For seven days our extra-terrestrial sojourners, of whom there were several hundred, remained where they were. Efforts were made to invite them into our midst, and minister to their comforts, although no one could tell what these comforts might be. Beyond entering the Capitol, White House and other places, they did not seem to need or care for anything. The Andromedans, as we named them, moved and flew about here and there, examining, testing everything with which they came in contact. Vegetable growths in particular seemed to interest them highly; they hovered about trees, bushes and other growths for long periods. A passing dog or other animal would draw their interest immediately; they would converge on it in numbers for study, and the animal would flee in great fright.

A scientific committee spent every minute possible in the company of the visitors, seeking to learn what they could. They in turn were not only interested in our efforts at interchange of intelligence, but seemed interested and puzzled at the construction of the human body, prodding and touching us constantly—a mildly uncomfortable experience, because their bodies were slightly charged with electricity.

During all this time very little more was learned regarding the Andromedans. Their mentality and ours seemed to offer no common ground for easy communication. They appeared to have no head, as we know it, no ears, nose, nor any other of the animal organs which we are wont to associate with intelligent life. As to the more intimate details regarding these beings, such as anatomical functions as well as means of contact with the objective, our understanding was very limited; insofar as it was impossible to examine them more thoroughly.

Then one morning the huge sphere gracefully lifted off the ground slowly like a mountainous bubble, and with an immense roar of machinery, floated off at an increasingly great speed in an easterly direction. Everyone was disappointed to see them go; and large numbers watched until the huge craft became a mere speck on the horizon.

Ships at sea reported sighting the sphere moving with incredible speed over the Atlantic. A few hours afterwards word was received from Belgium that the Andromedans had landed there, about ten kilometers from Antwerp, causing great excitement.

After a two days stay in Belgium, during which time the most eminent sicentists of Europe did their best to get what information they could, the Andromedans moved on and landed in Germany, near Münster. They stayed there a few days, causing the most tremendous furor, many journeying from England and far points of the continent to view the strange sight with their own eyes. Doubt of the extra-mundane origin of the strangers could no longer be entertained. Everywhere the Andromedans went they were followed by vast swarms of curious humanity, often so overwhelming in their forward surgings, despite the best efforts of police and military guards, that the visitors many times had to rise into the air to avoid being crushed.

For over a month the strangers in their flying globe moved on; stopping in Russia, China, India, and touching here and there, humanity eager and all agog. Their craft was continually sighted in various parts of the world, though, at the last, seldom landing. Finally no more was seen or heard of the space voyagers. They totally disappeared as suddenly and mysteriously as they had appeared. It was assumed that they departed from this Earth to continue their interstellar voyaging. And for many years the thrilling visit of the Andromedans remained an interesting subject of discussion in wide circles and in much print.

TWENTY-FIVE years passed by. Beyond the mere records of fact, the world had completely forgotten the stirring visit of life from another universe. A few moving pictures of the event, a few stray photographs of their far-off homeland the visitors left behind—that was all there was left to record. Outside of the knowledge that intelligent life in a strange form existed in a far-off pinpoint of space, and the immense impetus given the study of astronomy, the world was not changed one bit. The even tenor of its existence went on from generation to generation.

The world slowly improved, ever growing more efficient, more comfortable, more sanitary—and even more just. But the daily things of life, the good and the bad, continued just the same as they always have done for ages back. For however the outer forms of civilization may change, be it remembered that regardless of his material improvements, the inner life of man, his basic feelings and emotions, change but little—and these very very slowly. The same old vanities, the same old bigotries, the same old hatreds existed, with their resulting strife and miseries. And yet, there was no doubt about it; the world as a whole had grown better—much better and happier. Little did the world know or appreciate how well off it was. Had humanity had an inkling of the tragic drama about to be enacted, the inconsequential things of life, so important to many, would have seemed trifling indeed. The soul of man was soon to be tried with fire—his very existence doubtful.

Suddenly, on June 5, 1962, with a suddenness that staggers the imagination, the same strange beautiful beings which had stirred our world of a generation ago, appeared once more. This time, however, there arrived about a hundred of their huge metallic spheres, somewhat larger even than the first one of twenty-five years ago. The immense fleet landed in open ground eleven miles east of Cincinnati.

The excitement and astonishment caused by this second appearance of the Andromedans, defies description. In

the times of which we write, mechanical advancement had progressed at such an accelerating rate that almost anybody could reach almost anywhere very quickly; and as the day these huge globes landed was the week-end, vast throngs from great distances motored and flew to the spot—it takes very little to attract the multitude. Many even flew clear across the Atlantic to see the strange sight. Once again the whole world was thrilled to its innermost core.

That the Andromedans this time had come for some sort of important business was soon evident. For shortly after landing, their spherical vessels formed into a large circle, and began disgorging vast quantities of machinery and supplies. As each craft was manned by many hundreds of these exotic beings, it can readily be seen that there were several score thousand of them; each moving about in his graceful little airmobile, as we called it.

A scene of tremendous activity commenced, the like of which was never seen by human eye. With powerful machinery of immense size, the Andromedans began excavating, leveling, and building over a large area many square miles in extent. A concrete picture of what their unthinkably remote homeland must be like began to take form. Huge structures, many over a thousand feet high, steadily formed to rear their vast hulks from their deep foundations. And strangely beautiful they were too, so utterly different. The circle and oval, the ellipse and the spiral, were the predominating motifs. All their buildings were circular or oval in shape, gigantic in size, set well apart, the intervening spaces serving as streets. Here and there piercingly tall towers, two to three thousand feet in height, spiraled their graceful way up towards the sky. They constructed their materials right on the spot. Wherefrom they obtained the enormous power necessary to their operations was a mystery. At night the whole sky for miles around was aflame with the fires of their industry.

Gradually more and more was learned of the nature of our extra-mundane guests, which the short visit of a generation ago did not permit. Their power of sight, for instance, was considerably different from the human. Their eyes, of which they possessed three, were very mobile, being located at the tip of three stubs; and unlike ours they had the power of magnification, which they exert at will, when focusing on minute or distant objects. In addition, they had another sense which we humans lack—another sort of an eye, at the base of the triangle formed by the others, by means of which they could register rays of the ultra-violet, thereby enabling the Andromedans to see things forever invisible to us. Hearing they had none, nor could our authorities find any traces of the sense of smell, although our visitors reacted violently in the presence of putrescence. Neither did they have the power of speech, which, however, was no drawback to them, as they conversed among themselves by means of signs, incomprehensible to us, but which their ultrapowerful eyes enabled them to carry on even in the dark and at great distances.

Natural foods, such as we earthly creatures enjoy, they did not need. Their nourishment was of their own compounding, made from the natural elements, of which they partook by means of an organ in the center part of the body. They did not seem to need the intermediation of plants or animals for their sustenance; but had the power to absorb and assimilate and build their bodies directly, as only some of our plant life can. They did need air, and consumed large quantities of water. The metabolism was very low, and waste products negligible.

The most interesting thing about them was their sex—or rather lack of sex. We learned the amazing fact that these beings were extremely long of life, their average age running into several thousand years, equaled in duration only by our California Sequoias. Death, such as afflicts us mortals, is a thing undreaded with them; for their deaths are births, and their births are deaths, the offspring retaining even the memories of their immediate parents for the duration of their individual life. The Andromedans are monosexual; a form which, though lacking in interest from our viewpoint, nevertheless has its advantages by keeping their kind from division into two highly attractive but often antagonistic camps. At a point of their life comparable to our very ripe maturity, the mutual attraction of two Andromedans results in the beginning of a growth in each, which continues until the parent, usually at an extreme age, is finally discarded, thus giving birth to two individuals, never more nor less. Or it would be more correct to say, that two partly grown individuals take the place of the parents. This form of birth is always a joyful event and is the occasion for much celebration. The offspring at birth are already part grown, or rather, it would be more correct to state, that for a long time they are part of the body of the parent, gradually usurping its entity, until at a certain point the parent dies, and the children take on a separate existence. This, too, although not quite agreeable to our senses, has its advantages—the parent always knows the whereabouts of its children, and the children, after separation, may not have to worry about possible burdensome parents.

The Andromedans, although beautifully built and highly sensitive, are incapable of rapid self-locomotion. They have three appendages by means of which they can move about, but these are entirely too short and unfit for rapid progress either through long disuse or by nature; their movement was very slow and creepy. Practically every minute of their life, except during periods of rest which were very short, they spent in their little airmobiles, much as we do in our clothes. By means of these they became very swift and active indeed. Our scientists, who were free to study the strangers and their ways without any hindrance whatsoever, found these small flyers extremely interesting. As mentioned in a former place, these were small concaved disks in which the Andromedans went about and did their work. Long ago they discovered the related nature of gravitation and electricity as being basically one and the same thing; and so have been able to devise a way of insulating these disks, so as to free themselves at will from the attraction of gravity. The means by which this was done was, however, so extremely complicated as to defy the thorough understanding of our scientists; although they derived some very valuable ideas, which, it is hoped, will some day bear fruit.

The Andromedans were entirely peaceable beings. We looked in vain for any signs of querulousness, or any sort of combativeness. They went about all happily engaged in their various pursuits. Their greatest urge and passion seemed to be work and activity. To describe their social organization, as well as other interesting features, would take too long and is beyond the scope of this short narrative; the interested student, however, may obtain this at the proper sources.

BUT though the Andromedans went ahead steadily about their business of building, erecting and altering—the reasons for much of which we could but guess—apparently offering no harm; nevertheless they were excavating and otherwise changing enormous tracts of land on which were many prosperous farms, small settlements and public highways. All this was done without previous notice or permission. They simply concentrated at any chosen spot a vast amount of equipment, and commenced operations on such a titanic scale and in such large numbers, that one just had to move on. And so a great hue and cry went up, particularly from the farmers and small villagers whose property rights were thus violated without any notice whatsoever.

As the activities of the Andromedans continued, they became more and more objectionable, to say the least. And the complaints of the dispossessed and often homeless property owners became ever louder. Something had to be done. However, as the local authorities did not wish to be rude in any way to the celestial visitors, nor to be criticised by the interested outside world for untoward action—most likely they had no understanding nor idea of what we had long ago come to consider as property rights—an effort was made to communicate with the Andromedan leaders in order to explain to them the discomfort and grievous losses they were causing many citizens. Also at the same time the authorities wanted to know the why of their building operations, which by this time were beginning to assume immense proportions.

Accordingly, Sheriff Harold S. Lowell, of Hamilton County, requested the group of scientists who were in constant touch, to explain the serious situation to the newcomers, so that their stay would be as pleasant and non-irritating as possible; to convey our desire to treat them with the utmost cordiality and good will. No one at the time thought that their second visit to our earth, although on a much larger and more active scale, was anything more than transitory.

This approach was made. But although every effort was made, either they would not, or could not, be made to understand our ingrained repugnance to the violation of property rights. Speech, as we know it, they had none. But they learned to write our language, and we in turn learned to write theirs. A deal more was learned from the Andromedans concerning their home world and manner of existence. And the salient facts of their existence ran something like this:

Their cosmic system, located in one of the spirals of the Great Nebula of Andromeda, on the far side, unlike our Solar System, was a binary, so common in siderial space. It consisted of a sun larger than ours, and around it revolved a small dark companion about the size of our earth which was their home. The physical nature of their planet was remarkably like ours, which it resembled in its make-up of land, water and meteorological conditions, except that their planet contained about twice our proportion of surface land area, and only about half of the water.

Vegetation and other forms of life they did not know of; or if they ever did exist, they had practically no record of it. For ages and ages as far as their knowledge went, they were the only form of life on their world, there being no other kind coexistent as in our world. They found so few records of former life, and these were so fragmentary in their nature, that although they knew that some time in the remote past there had been other life on their planet, it was so long ago that the very existence of it had been forgotten. Due to some cataclysm or other causes of which they themselves didn' know the origin or nature, the Andromedans did not have a complete record of their descent.

Their numbers ran into six trillions. So crowded had living conditions become for them on their planet, which we named in our records as Androm, that their habitations had made of it one vast continuous city.

About seventy-five thousand years ago living conditions and requirements had become so intense, that practically the final limit had at last been reached—in spite of all their science and all their art. They had long ago perfected a means of traveling through space; and for scores of thousands of years their space travelers had covered abysmal distances throughout their own universe and many others, seeking another world fit to live on. And always and as far as they went, and wherever they went, they found space void and lifeless; the infinite number of bodies it contained uninhabited and uninhabitable.

For strange to say, although most of us on this earth had always taken it for granted otherwise, our Andromedan visitors informed us that life—any kind of life—is a rare phenomenon indeed throughout the length and breadth of infinite space; that so far as they had discovered—and they had covered incomprehensibly vast reaches of space—there was no other life extant, excepting on their planet Androm and our planet Earth. They found our galactic universe and other universes, although containing uncountable numbers of stars and other forms of matter—these were all either too hot or too cold, too small or too large, their physical content and form in some way entirely unsuited to support the vital processes of life. Even when they did find a body in itself suitable, it was either too close to its luminary or too far, its axial inclinations too oblique or its orbital path too extreme, or the warmth giving rays were of a kind destructive to life altogether. In short, the conditions which give birth to life and permit the vital processes necessary for its continuance, are so infinitely rare, so complicated, of such a rare combination of causes—the necessary fine balance so easily upset; that life, though plentiful on the two planets, was the most rare thing in the whole Universe.

The Andromedans had reached a marvelously advanced plane in their arts, their sciences and engineering skill; and were able to bring about enormous transforming works, greatly controlling the weather and other conditions. But they needed the kind of atmosphere we do, also water, and plenty of it; neither could they thrive, mainly for reasons of gravity, on a world much larger or smaller than our Earth.

And so, when they first sighted our system twenty-five years ago, they were impressed with the beauty and changing colors of our Earth. They decided on a closer inspection before moving on, slackening their tremendous speed accordingly. While still far away, there was that about the appearance of our planet which interested them more than any other they had seen before. Their powerful telescopes revealed thrilling signs of what could only be explained by the possible existence of life. When they landed, and saw that terrestrial conditions were tolerable for them, and that above all there was life, they were as stunned as we were to see them.

At last, here was a world to colonize, to take the sur-

plus population of their world! It took them twelve years to return to Androm; and the news which they brought was received with great joy and relief. Their world had practically given up finding another livable globe, and certainly never expected to find life anywhere on any other than their own.

Immediately a great expedition was fitted out and sent speeding its way toward the Milky Way. It took consummate skill to find again our speck of a solar system —our sun being only one of the billions the galaxy contains. Also the disconcerting news was imparted that they were but the advance guard; that many other expeditions were being fitted out as rapidly as possible to follow on their heels; for the biologic pressure of their growing population, although very slowly increasing, had now become absolutely unendurable.

Our physicists and astronomers were greatly puzzled, however, by what means they were able to bridge such vast distances in such a short time as twelve years. But as near as they could gather—for the understanding of it required the knowledge of complicated mathematical operations and physical laws which it would take years to understand, much less to fully master—the Andromedans had a means of rapid acceleration that had no absolute limit. This acceleration they could increase at a geometrical ratio, till they went with the speed of light. Once the critical speed of light was reached, the ordinary laws of time, space, matter and velocity ceased to operate. They moved as if in another dimension, enabling them to attain a speed which covered interstellar distances as an airplane covers earthly distances. And, of course, they were able to decelerate by the same means. In their long voyaging they sometimes passed entirely through a gaseous nebula, hardly knowing it, for many of these gaseous nebulae are millions of times more rarefied than any artificial vacuum. They were equipped with special delicate instruments to automatically avoid accidental collision with bodies of harmful size. Thus we see that the marvel of mind has always been its ability to circumvent, as it were, or rather to take advantage of, the unknown laws of nature.

IN the meantime, the Andromedans and their works became increasingly interesting, and excited everyone's imagination. They were the leading news feature. The entire world was kept informed, and they who could not take in the sights on the spot saw and heard with unabated interest the doings of the Andromedans over their televisors and radios.

But what was at first a highly interesting event—for the doings of these other world beings were extremely interesting and on a truly majestic scale—became in time somewhat disconcerting; for it took on all the earmarks of a permanent settlement. And as their activities grew and spread, ever including more and more area, the authorities began to be alarmed. It was also feared that some of the irate farmers, whose homes and farms were destroyed, would take matters into their own hands and resort to firearms—thereby creating an unpleasant complication. For what cared they about the romance of other world visitors, when their homes were at stake.

The local authorities, scarce knowing what to do in this unprecedented situation, and feeling that it had become a matter of more than local importance, appealed to Governor Whalen. However, as the State authorities neither would countenance nor wished the use of force, it was decided it would be best to leave the Andromedans alone. Besides, the general opinion was that if kept within bounds the tremendous industry of the strange settlers would add enough to the general wealth to more than make up for the few square miles they occupied. The upshot of the whole matter was that the Ohio Legislature, approved by the Governor, voted from the State Treasury indemnification amounts covering the losses suffered by the dispossessed landowners. Also the Andromedans were enjoined from extending their operations beyond certain specified boundaries without conforming to our established laws.

It was soon found that this did not help matters for long. And to add to the growing seriousness of the situation, some months after the first arrival, another expedition as large as the first landed alongside the first. From then on a constant stream of new arrivals came, landing Andromedans by the scores of thousands, who from their first center spread out farther and farther.

By the time a year had gone by the situation had grown serious to the last degree. Their ever-spreading activities reached and threatened the environs of Cincinnati, and had swallowed up all the villages around. They even bridged the Ohio, and commenced their operations in Kentucky. The State authorities, who had exhausted all their efforts to keep the peace, were at their wits' end. The situation was all the harder to handle in so far as these beautiful intelligent beings were very gentle and seemed totally harmless. Except for their usurpation of property and land, not a human hair had been touched. They just didn't seem to understand our laws. So far there had been a constant friendly intercourse. Our experts and men of learning gleaned many valuable processes of a practical nature. The Andromedans were marvelous technicians and artists; and they showed us a few tricks, particularly in the realms of metallurgy, chemistry and mechanics, that made our experts feel like rank novices. Just the same we watched their activities with growing concern.

But when a great important city like Cincinnati appeared to be in the path of certain destruction, it became a different matter altogether. Things had gone entirely too far. The bewildering situation had taken on such enormous proportions that it was too big to be easily handled. It was like an insidious growth in the body, to which growth one does not attach full significance until it is too late. Everyone suddenly woke up to the real danger. And the governors of Ohio and Kentucky, not caring to assume responsibility for a state of affairs which they felt had grown beyond their control, it was decided to throw the whole matter into the hands of the Federal authorities.

Realizing that here was a condition of affairs fraught with possible dynamite, the consequences of which no one could foresee, the Federal authorities decided to take active steps toward a solution of the problem. The Andromedans were informed in a courteous but firm manner that their spreading activities were highly objectionable. They could remain where they were, as they were already settled, by contributing in kind to the general welfare. But all further spreading must cease altogether and immediately.

By this time intercommunication had so progressed that the new settlers fully understood our demands. They made it plain to us, however, that they wished no harm as to our life and human activities; but inexorable necessity

forced them to take whatever space was needed for their ever enlarging population. And as furthermore great numbers of their kin were on the way, and would continue to come in a vast migration to our planet, that we humans had best get accustomed to the idea right now and live our own life as best we may, without bothering or interfering with them, even though their usurpation of land conflicted with our rights.

Of course, all this was utterly preposterous. It was tantamount to conquest of part of our fair land, and could not be suffered in any degree.

It was the constant arrival of these strange beings from another universe which was the most alarming thing about the whole business. The quiet persistent pressure of their peaceful infiltration, the rapid spread of their enormous engineering and building works, produced an ever growing tenseness in an utterly undreamed of situation. They were changing entirely the landscape wherein their activities centered. Had they been some foreign humans who had thus settled uninvited amongst us, action would have taken place sure and swift long before this. But it was the very unusualness of the thing, the unbelievable, astounding happening going on right under our very noses, as it were, coupled with our first natural interest in the strange newcomers, which had disarmed us at first and allayed any apprehension.

The remarkable state of affairs was brought home directly to the Europeans also, by the landing of another large contingent of Andromedans on the western border of Germany, who being aware of our perplexing problem, looked not with kindly eye upon their uninvited guests. Then shortly thereafter in quick succession, a colony settled in Spain, another in England, and still another in southern Russia.

Our first enthusiastic reception and courtesies extended the celestial beings, now gave way to genuine alarm. The situation had become impossible.

The President called an extraordinary session of Congress to meet the growing danger. Pacifists were howled down, and force was decided upon, distasteful though it was to many.

The War Department was authorized to take whatever steps were necessary. Large numbers of militia and Federal troops were called out, under the command of Major General Bruce T. Wallace, and began concentrating about the affected district. Artillery was massed in close formation, forming a ring of steel about the Andromedans; while large fleets of observation and bombing planes were held in readiness for action.

Be it remembered that all this time the objects of our concern were going peaceably about their business, paying not the slightest attention to our military maneuvers. They did not seem aware of the fact that punitive action threatened them. Our newspaper men, and for that matter anyone else who chose, had perfect access and liberty to the vast city which the Andromedans were building. They were very friendly and took every precaution to avoid bodily injury to man or beast. Beyond their usurpations they were entirely peaceable and harmless. It seemed a shame to fire upon these apparently defenseless, industrious, intelligent beings who were busily engaged in digging canals, building immense industries, architectural structures beautiful to behold, wide streets paved with a shiny metal, and other creations of a wonderful civilization. However there was nothing else to do.

An ultimatum was delivered the Andromedans on July 16th, 1963. It stated that where they had already settled, those that were here could continue as they were, subject to laws of the land; but no new immigrants of their kind would be allowed to remain; that further encroachment on new territory was strictly forbidden; that they were to pay, in a manner to be decided on later, the full amount of the value of the land they occupied and gun-fire would be resorted to if they disobeyed. They were given twenty-four hours to comply with and acknowledge acceptance of the terms of the ultimatum, which expired ten A. M. the following day.

Interest was everywhere at fever heat. The Germans and Russians, who by now each had a very large colony of their own to deal with, were awaiting the outcome on this side of the Atlantic to follow our precedent. No one really knew what the consequences would be, although no one doubted the ability of the military to control the situation. The Andromedans were not warlike. War was a thing unknown in their world. Our military intelligence reported they saw not the slightest sign of means of offence or defense, although no doubt their great knowledge and vast powers of industry were fully capable of a great deal if given time. They could be easily destroyed long before they knew what it was all about.

All civilians were ordered out of the district, and everything was held in readiness for the blow-off.

Evidently the Andromedans either would not or could not understand our warlike intentions, or had decided to pay no attention to the ultimatum. So promptly at ten o'clock, at the expiration of the ultimatum, the military forces let go. A terrific, overwhelming artillery fire was laid over the entire area. Overhead aerial forces dropped huge quantities of the most destructive explosives. Even poison gas of the deadliest kind was liberated in enormous volume, in an effort to wipe out the entire area in the shortest possible time. The din could be heard for miles and miles. It seemed nothing could remain alive. At the end of three hours of continuous bombardment, orders were issued to cease; and reconnoitering planes flew all over the affected area to see the result.

They reported vast damage had been done. Great numbers of the Andromedans were caught in the concentrated fire and killed. But with a shock of amazement it was learned that their huge spheres, of which there were many hundreds had not been injured in the slightest; and the surviving Andromedans had no doubt taken refuge in them. These spherical space flyers had evidently been constructed of a material to withstand any accidental shocks encountered in their cosmic flights; and our mightiest gun fire and explosives had made as much impression on their huge craft as peas would against a concrete building.

Another bombardment was ordered, this time concentrated on the globes, their space fliers. Suddenly these were seen to rise into the air; and in the midst of the deafening noise, there shot forth from all their globes blinding, lightning-like flashes, accompanied by terrific thunderclaps—striking the massed artillery and military forces. These lightning flashes came in a tremendously fast, flickering succession, paralyzing in their searing heat, and striking with all the force of a million thunderbolts, instantly enveloped the entire countryside with continuous white hot, explosive sheets of flame, shattering and destroying everything, and blowing up all

the ammunition and explosives gathered about. The entire earth heaved and shook, as if in the grip of a violent earthquake.

The devastation caused by these electric discharges, for such they appeared to be, is beyond description. Men and guns lay around in indescribable confusion. Many who were not dead seemed paralyzed. In less than fifteen minutes our entire artillery was completely silenced, and of the large fleet of powerful bombers nearly all were brought down. The remaining soldiery were ordered to retreat to avoid utter annihilation. A lesson was taught us in destructiveness, the like and the overwhelming power of which was never before experienced on this planet. Horror, consternation and anger filled everyone's heart.

After the terrible destruction of our military forces, with their sickening loss of life, the Andromedans emerged from their fortress globes, and commenced reconstruction of their shattered area. They made no effort at reprisal nor pursuit; but the way they stationed their globes there could be no doubt that they were now ready to meet another attack very promptly.

THE United States War Department began to make war preparations on a gigantic scale. The General Staff met and decided on another attack. This time the enemy was to be taken by surprise. All available troops were called out and stationed in a far-flung circle far enough removed from the affected area to avoid overwhelming loss of life. After all necessary preparations were made the attack in force was ordered. The Ninth Corps and five full divisions of the Second Mechanized Army, stationed on the west and north, and the entire First Mechanized Army on the east, converged suddenly on the enemy in their speeding armored cars. At the same time, the main force of all-metal war planes, each carrying over a hundred men, shot forward. Across the Ohio River, well concealed, were ranged battery upon battery, to intercept the enemy if they sought safety in flight across the river. The enemy was to be given no preparatory announcement of the impending attack, but were to be taken on all flanks completely by surprise and destroyed before they could get into action.

With great speed our forces rushed forward, and it looked as if nothing could stop them. The orders were to kill or capture every living Andromedan. Then, once again, those terrible, flickering flashes commenced enveloping and annihilating everything. Not one armored car or plane succeeded in getting anywhere near enough to come to grips; they were burned and shattered, or blown up by their own ammunition. Very few escaped when the retreat sounded.

On the other side of the Atlantic, the Germans, aided by the Belgians, on whose border the Andromedans settled, had followed the tactics of the United States forces; and their attacking forces, too, were completely destroyed. The same fate befell the Russians. Following hard upon this, news reached the civilized world that another colony of these unwelcome immigrants had landed in China, near Hankow; and still others in Asia Minor, India, Egypt and Morocco. And from all these centers, reinforced by the constant flood of newcomers, the invaders were rapidly spreading out in all directions.

There was now no doubt about it. This faroff world in the remote reaches of space—the very existence of which was unknown to us, and such an invasion considered, if at all, as in the realm of the imagination—this far-off world, overpopulated, driven by a vast expanding life-force, and possessed of the power and means—were intent on sending their millions, even their billions, to colonize the Earth; and if need be take forcible possession of whatever portions they wished.

The more timid among mankind counselled that these newcomers should be left in peace, so long as they were not destructive of life. But the general opinion the world over agreed that the situation was impossible; that unless humanity wished to be shoved off the earth, as it were, the invaders must be destroyed, cost what it would.

A GREAT international council took place in London, March 18, 1964. Things had come to such a state that everyone realized the mortal danger which threatened the entire world. Every effort to resist so far had been smothered in destruction and death. No single nation could cope with the power of the Andromedans. All the civil, political and military leaders gathered to decide how best to grapple with the common enemy. For once all nations and peoples were united. The instinct of preservation made the whole world kin.

At a solemn conclave in plenary session it was unanimously agreed that all nations, big and little, should each contribute according to their power and ability, in defense of the common cause. An International Council of War Ministers was formed. The supreme command of all the forces was placed in the hands of a triumvirate, composed of Marshal Francois Fournel of France, Charles H. Biggers, the American industrialist; and Dr. Friedrich Hans Golter, Germany's great scientist. The reason an industrialist and a scientist were placed in command together with a soldier was because it had long been recognized that in a modern war, especially in a war of this kind where industrial and scientific resources were the deciding factors, military strategy alone would not win. This was going to be no mere marching back and forth, or stalemated trench warfare, such as previous wars had been between members of the same human family. Naval power did not even enter into consideration. They could not be starved out. Here was needed science, industry—the artfully conceived and executed application of tremendously destructive power—to the end that these other-world enemies of mankind should be destroyed utterly; or at least be forced to depart. Human civilization marshalled its forces and girded its loins for the titanic struggle.

But every effort proved futile and without avail. There seemed to be no effective way to grapple with the Andromedans. Every new, every supreme effort was overwhelmed again and again. And like fast-spreading, mountainous mushrooms—mushrooms with deep roots of steel and bodies of indestructible material—the Andromedan cities kept growing and spreading, ever usurping and extending—east and west, north and south—in an ever widening belt clear around the world. They altered the courses of mighty rivers; they changed the very topography of the earth to suit the needs of their particular civilization. Like a beautiful, yet malignant growth, they spread and covered the fair face of our good old Mother Earth.

Extensive mine fields of the most destructive kind were planted in belts miles wide completely around their

settlements. To no avail. For as soon as the Andromedans learned of their nature, the mines were quickly blown up from a distance by their terrible lightning forces. The explosions of these mines at times actually aided the enemy in their operations. Deadly aerial bombs directed from a distance by radio were tried. But these proved more of a boomerang than anything else; for just as soon as the Andromedans, by means of their instruments, located our sending stations, they dispatched fleets of their invincible globes and made chaos of entire regions. Poison gas, of a new and deadly kind, invented by the English, was resorted to and a surprise attack simultaneously in many places did cause large loss of life among the enemy; but after that our forces were unable to get near enough to drive home.

In addition to their shattering powers the Andromedans employed a wave length of the ultra-violet type, entirely mysterious to us, but which brought paralysis and death at a great distance to all life it touched.

New ideas, inventions, and suggestions poured in to Great Headquarters from all over the world. Everything that seemed worthwhile was given serious consideration. Holland flooded large parts of their country to stop the enemy's advance, but it proved a useless sacrifice, for the Andromedans soon drained the flooded areas. In India, in northern Africa, large numbers of natives lost their lives in futile, fanatical charges. In Japan two entire armies were wiped out in a vain attempt to save Tokio. Brave men there were and many. But humanity simply was outclassed and overpowered. We could not cross swords with the enemy on an even basis. It was like fighting with bows and arrows against machine guns and artillery.

In desperation the high command was finally turned over to new military and naval heads for a supreme effort. Enormous, frantic preparations were made throughout the wide world. Every Andromedan sector was to be stormed simultaneously with every possible means. It was to be a surprise attack on an epic scale.

At the zero hour a radio signal flashed all around the world; and the entire forces of every nation, big and little were hurled forward to take by storm every stronghold, and overwhelm the invaders with one fell swoop. The attacks were terrific. Persistently and fiercely, with ever-mounting, staggering losses we humans drove on, ever on. There was no stopping, no turning back. Savagely, desperately our attacks continued in the very jaws of death. The heroic greatness of man, won with a billion deaths on countless battlefields, rose to supreme heights. The Andromedans, if they had such feelings at all, must have been filled with admiration for the epic spectacle of this magnificent heroism, which knew no let-up and defied death itself. But they had by this time become fully aware of the determination, the craftiness and the destructive might of us humans, and were fully prepared. They evidently expected it and were not caught unawares. Vast numbers of soldiers and other combatants were annihilated by their irresistible powers of destruction. All efforts were futile. It was maddening not to be able even to come to close quarters with the enemy—it was like hordes of savages against organized steel and explosives.

A GREAT and unexpected tragedy had befallen mankind. That such a state of affairs should have come to pass seemed unbelievable. Here was the shuddering, the humiliating spectacle of Man, hitherto the lord of creation, bowing his head before a new master.

The flood of ever-arriving Andromedans spread and spread like an all-engulfing ocean, steadily, surely, relentlessly. Day and night a constant stream of their spacefliers dropped out of the sky, disgorged their passengers, and departed. They came by the millions. To the observer there was something overwhelming, something irresistibly cosmic, about it. As the Andromedans spread, humanity was forced to recede; not east or west, but north and south, for the conquerors were extending themselves in an ever-widening, continuous belt clear around the world. And as they spread, our cities and countrysides were completely leveled and reconstructed according to their own civilization.

For countless ages Man had ruled the earth. Wherever he went all other forms of life receded before him, or became subject to his will. But his sovereignty over the world meant untold tragedy to the lower forms of life. Not always were man's conquests peaceable or bloodless; in fact, they were seldom that. Always, nearly always, man's cruelty to animal life, even to himself, has caused endless suffering—often needless suffering. In his egotism and power man has naively taken it for granted that all living things were placed here for his special benefit—just given him to use as he saw fit. He tortured, he slew—he ate his living contemporaries. In his vanity he built whole religions to justify all this cruelty. And this cruelty to life, although often inevitable, was not always necessary. Many harmless, interesting species that took ages upon ages to evolve in the economic scheme of nature, man has utterly caused to become extinct without benefit to anyone—often for the sake of sport. Have the strong always been kind and generous? What of the Mayas? The North American Indian? And what of all subject peoples?

Overnight, as it were, the conditions had suddenly been reversed. The tragic spectacle of mankind, which for ages had taken its overlordship of the earth for granted, suddenly found itself in the same position in relation to the Andromedans as the inferior creatures formerly bore to mankind. It is true they were spared the horrors of being eaten and used at will, as man has done with his inferiors; for the Andromedans had no need of man nor of the other forms of life. But ever-increasing masses of humanity throughout the globe found themselves homeless and poverty-stricken; forced to move on and on, always north or south. Families of wealth and influence, the rulers, the mighty of this earth, found their property and means of sustenance gone; gradually but surely forced to the level of the lowly and dispossessed. Verily, a mighty nemesis had overtaken mankind, overwhelming and complete in its punishment. The good and the bad, the poor and the rich, the strong and the weak, the just and the wicked, the arrogant and the meek—all were engulfed in this consuming disaster.

Still the inexorable spreading of the conquerors went on; east and west, north and south. The mighty stream of their migration continued until they usurped the best of the habitable globe. Human civilization groped, staggered and fell. Suicide, pestilence, hunger and exposure took their frightful toll. Untold millions perished

At last the pressure of the conquerors ceased. The avalanche had spent itself. In this most frightful of forced migrations all semblance of order, all former national boundaries and divisions were obliterated. All

humanity, or what was left of it, became as one. And be it said to the everlasting credit and honor of man—bespeaking the truly fine grains of gold hidden in his make-up—that a common lot and a common suffering united all; and heroism, generosity and self-sacrifice were common.

A TERRIBLE pestilence had broken out amidst the surviving masses of humanity, the vast majority of whom were seeking to reconstruct their lives in the hitherto unsettled temperate and arctic lands. It was a new and unknown disease, quick and fatal in its effect. The air was full of it; and in the disorganized condition existing there seemed no effective way to combat the disease. It continued to carry off larger and larger numbers till it was feared that, what the conquering Andromedans left undone, this fearful pestilence would complete.

Prominent among the doctors in Siberia, battling with this new foe that was filling man's cup of woe to the brim, was Dr. Sakaida Kawamura of Japan, formerly a bacteriologist of the now destroyed Flowery Kingdom. With a group of American and Russian colleagues he labored to do what was possible in stamping out the dread disease. Dr. Kawamura had been the leading world authority on bacteriology. He finally succeeded in isolating the germs of this disease. Gradually an idea formed in his mind. He discussed it with his colleagues; secrecy was enjoined. A completely worked-out plan was presented to the Council of War Ministers, which still functioned.

The plan was approved. As drowning men catch at a straw, so did those who kept their heads in this supreme hour of tragedy grasp at the new idea. Throughout untold generations, in his great trials, one of the saving elements of Man has been the magic word: hope. The idea did hold out great hope; news was flashed about without revealing its nature to bolster waning spirits and instill new courage.

A secret expedition was carefully fitted out. It was a dangerous mission, composed solely of volunteers of all races, for it most likely meant sure death. Each man was carefully trained and rehearsed for his part. To be at all successful there could be no slip-up, for the enemy was sharply on the lookout at all times; and it was extremely difficult to get very far into their territory. The plan of action was as follows: Several hundred planes of the new kind, capable of over six hundred miles an hour, were each equipped with thousands of small cylinders containing the active virus of the terrible disease—thanks to Dr. Kawamura—now under control as far as mankind was concerned. The cylinders also contained, in addition to the virulent culture, quantities of fine steel splinters, and were made to float to ground where the slightest touch would detonate them, scattering the deadly messengers far and wide. The planes, stationed clear around the world, each as close as possible to the largest enemy centers, were to dash forward, release their deadly missiles at the right moment, and retreat as best as they could. Thus it was hoped that in thousands of places these virulent germs would start in their deadly work midst the enemy and accomplish in their invisible might that which the most powerful means at our command failed to do.

After every plane had taken its station, each manned by the pick of the world's aviators, a prearranged radio signal flashed the orders to start these brave heroes on their dangerous mission. Though it probably meant death to them, it might prove the salvation of mankind; and they departed with the fervent prayers of all humanity for their success and safe return.

Time elapsed. Nothing was known of the result. A number of the daring heroes returned; the rest never came back. It was learned that thousands of the deadly messengers, in widely scattered places where the enemy lived in greatest numbers, went home. The disease was respiratory in its effect, and as the Andromedans were air-breathers, unless they were far better equipped to battle with it than we were—in these matters doubtful—the epidemic should spread; and, being most violent in warmer climes, might destroy the hated enemy or, at least cause vast numbers to die. But, alas for the hopes of humanity. Nothing happened. If the pestilence did get a start, either they were more immune or their science was capable of coping with it. The plan failed to produce the desired result. Stark grief and despair seized everyone.

FRANK RUSSELL HOPKINS, Sc.D., Ph.D., formerly of Cambridge, Mass., had settled in Manitoba. Along with the rest of uprooted humanity he was endeavoring to reconstruct as well as possible his shattered life. He had lost his only son and eldest daughter, a daring aviatrix, in the general cataclysm. With his wife and young daughter they had fled from their native New England home, which their forebears had settled centuries ago, and, gathering what meager possessions it was possible to take, moved north, away from the dreaded invaders.

A time came when it meant sure death to remain. At first, great numbers, finding the usurpers benignly indifferent toward taking life, lingered on, trying their best to live among the conquerors. But this was a difficult thing to do. For our bodily habits and manner of living were so distasteful to them that those who lingered were at first unceremoniously pushed to one side—in such a manner as one would disregard a nest of ants—and then, realizing there could be no truce between themselves and revengefully determined humanity, they put to death those who resisted. Finally, exasperated by the tremendous and ceaseless efforts of us humans to defend our birthright, and harrassed by our constant incursions—for perseverance is one of the innate qualities which formerly aided Man in world dominance—the Andromedans destroyed on sight any human being within their reach.

For several generations the family of Hopkins had been of the typically inventive type, contributing mightily to our vast industrial progress—usually with small recompense. As is often the case, the dreamer and the inventor does not always share in the fruits of his ideas; so the Hopkinses, though prolific of ideas that enriched civilization, lived with modest means—often even pinched for the good things of life.

For years Dr. Frank Hopkins had been on the experimental laboratory staff of a great industrial firm in Pittsburgh. For a number of years before that he was on the faculty of a large eastern university. But, finding the niggardly pay of the teaching profession shamefully inadequate, he resigned in disgust and joined the laboratory staff of the Pittsburgh firm. He was an indefatigable worker; his knowledge of physical phenomena was

far beyond the ordinary. Many an important discovery or invention, which he always assigned to his company, increasing their huge dividends, meant but a modest increase in his income. However, he was frugal in his habits, and, aided by an extra commission here and there, at the age of fifty managed to save up a modest competence.

The great, all-absorbing dream of Dr. Hopkins was the release of atamic energy. Locked up in every grain of sand, every bit of matter, were enormous stores of energy, which, if it could only be tapped, would revolutionize the world. For years all of Dr. Hopkins' spare time, and more, was occupied with this dazzling possibility. So absorbed did he finally become in his great dream, that as time went on he became more and more absent-minded, and his daily work at the plant suffered in consequence. It prevented the rapid promotion which his recognized great abilities might have brought him. He was a kindly soul, always putting himself out for others and beloved by all.

Upon the inheritance of a legacy left to his wife, the family came into an independent position. She understood her scholarly, dreaming husband for what he really was and was immensely proud of him. She loved him dearly, forever looking to his comfort and shielding him from petty annoyances. They decided to leave Pittsburgh, which they never liked, and once more took up residence in their native town of Cambridge. There Dr. Hopkins devoted all his time to the working out of his great dream.

Several times he had been on the very verge of the epochal discovery—a discovery that would do for civilization what fire did for primeval man in the dim and forgotten past. He knew all this. But always that all-important detail, necessary to complete practicality, eluded him. For hours, for days, his mind would wrestle with the problem, until weary and exhausted he would drop off into slumber, from which he would waken to take up the subject with renewed determination.

On the bitter day of his forced migration, with fear in every heart, and the temperature hovering round zero, he managed to take along his beloved instruments and laboratory equipment. He cursed the Andromedans for interrupting his researches—just when he felt that the long years of his intense efforts, combined with his prodigious knowledge, were at last about to come to a supreme realization. But there was no help for it; the icy breath of death was not far away. And with the fear of the hunted, and the driven, which mankind was experiencing in all its bitterness, Dr. Hopkins and his little family departed in haste from their ancient homeland.

Northward in their machines loaded to capacity, in company with fellow sufferers, they trekked their way in the bitter cold of winter. Whither, no one scarcely knew—nor how it would end. Refugees from all over the world crowded into north Canada, one of the havens of refuge.

In common with some of his former townsmen in far off Manitoba—for thus far had they been driven—Dr. Hopkins took up the loose ends of his existence. Rude shelters were built; bravely the semblance of a civilized life was carried on. Large numbers of people in all walks of life were crowded together, sharing the same hardships. The senseless frivolities, the stupid inanities, which formerly loomed so large and important in the minds of many, were now meaningless—only worthwhile things mattered. In this great transvaluation of all values things were where they belonged, and the true were quickly sifted out from the false.

The first signs of approaching spring were hailed with great joy and thanksgiving. The relentless pressure of the Andromedans had relaxed. There was time to breathe.

Once more Dr. Hopkins took up his long neglected researches in quest of his beloved subject of atomic energy. The profound misery of those about him only redoubled his energy and determination to succeed. Clear as a bell he saw the immense possibilities. If he succeeded, a weapon could be forged whose irresistible might should redeem all for lost humanity; would replace Man on the throne from which he had been so rudely thrown. His great mind bent to the task.

IT was a great day for mankind when his efforts met with success. The final, elusive sides of the problem were solved. Again and again he tested it, thoroughly, positively—proved to himself, beyond the peradventure of a doubt, that he held in his hand a new power, infinitely great, for good or evil.

Dr. Frank Russell Hopkins stood before the august Council of War Ministers—now shorn of power—demonstrating and explaining his tremendous discovery. With bated breath and shining eye he explained as best he could the workings of this infinite storehouse of energy, which he had solved at last through a combination of discovery, intuitive deduction and ingenious invention. With wide open eyes and gaping mouths, they saw and understood. They saw its god-like power and significance. Carefully planned and rightly used, deliverance could be wrung from the conquerors.

The highly mathematical technical details were hard to understand for the layman and could scarcely be followed even by the expert. In general, and briefly, Dr. Hopkins had discovered a method of exciting the potential energy locked within the atom, a way to break down the ordinary relations between its proton and electrons, thereby releasing forces that would all but detonate the whole earth, if not properly controlled. Once this excitation of atomic energy in matter was induced, it had a tendency to spread with an unquenchable fierceness, a degree of heat that would volatilize everything in its path; and unless stopped would continue its steady spread until the entire surface of the earth was in an all-consuming flame. Nothing could put it out. The heat caused by the release of this atomic energy would burn fiercely for months and years, burning itself out only when the atomic energy in the surface it was attacking was dissipated; and a diamond-hard, trancendentally heavy substance remained as a residue. The disintegration could not go far below the surface, as the free oxygen in the air was a necessary part of the consuming process.

There was only one substance which was impervious to and could confine this all-consuming energy—a chalk-like substance which Dr. Hopkins had worked out. This could be easily manufactured in great quantities. Its successful formula had been the most difficult thing his genius had to contend with—the doctor had tried every known element and possible combination of elements—and its invention was perhaps the most marvelous part of the whole discovery. (*Continued on page* 81)

THE Chinese, ingenious in methods of torture, have a very effective method for disposing of their victims or making them "confess"—the constant slow dripping of cold water on the head of the victim. The very monotony of the slowness and rhythm of this continual drip, drip, drip, and the slow chill of the water work havoc with the victim. But a slow, everlasting monotony is not the only sure means of eliminating human life. An accelerating rhythm of certain sounds must have definite detrimental effects on the human organism—depending upon various factors, some of which are cleverly considered in this story by Mr. Cloukey.

Illustrated by
MOREY

Then the three of us listened to an unusual speech. . . . It was that suppressed pride in his accomplishments that caused him to tell his plans

RHYTHM

By
Charles Cloukey

Author of—"Sub-Satellite," "Paradox," etc.

IT was several years ago, in 1999, to be exact, that Graham Greene and the Flaming Atom and I had our little adventure with the cold-blooded Calvroon and his rhythmic toy. It was quite a scientific affair. Because of my lifelong friendship with Graham Greene, I witnessed the entire drama from beginning to end without taking a very active part in it. Who I am doesn't matter, but I'll have to tell you something about Greene and the Atom or you won't understand my story.

First, Graham was the step-nephew of Elmer Calvroon. Second, he was a cripple and a scientist and a human, lovable man. The Flaming Atom loved him, loved him even more because he was a cripple. You see, he had been flying from New York up to the Maine coast to spend a week-end with her and her family, when an unexpected sleet-storm of exceptional violence had so blinded him in his little runabout sport model monoplane that he had crashed in the New Hampshire hills. Both his feet were crushed and it was almost three days before he was found, so secluded was the place where he fell. Infection had set in, and in spite of the marvelous medical science we possess at the dawn of the twenty-first century, the left leg came off at the knee and the right at the ankle. His heart was permanently weakened. Calvroon learned of this last fact. Graham never made a secret of it.

Greene had been engaged to the Atom for more than a year before his crash. The accident made no change

in their plans. They had still almost a year to wait, for the girl's parents insisted strongly that she was not to marry until she was twenty-one.

"Flaming Atom" was my friend's scientific pet name for her who had nursed him back to health and life. It fitted her perfectly, whereas her real name, Elsie Damon, absolutely failed to do so. She lacked an inch or so of five feet, while Greene was six-feet-three with his artificial legs. She possessed a head of hair whose color closely approximated cochineal carmine, instead of the bricky orange common to most red-headed people. With her intense restless energy and her turbulent emotional temperament, she thoroughly justified the appellation.

He and she and I were listening attentively to the legal matter being discussed by Paul Jameson, family lawyer to three generations of scientific Greenes. The aged legal man was replying to a question that had been posed by Graham.

"The first of next month will be the tenth anniversary of the disappearance of your father. Unless he should reappear before that day he will be considered legally dead, according to the present laws of the state, and the fortune will go to you, together with the only key in the world to Vault Number Three of the Second National Bank, which is one of the business properties your father controlled. In the vault are the only remaining descriptions and records, the notes, apparatus and instructions which would permit a scientist to repeat one of your father's greatest discoveries, the secret of which, at the present time, is known to no other man. You are aware of that to which I refer.

"If, however, you should die before the first, the fortune and the key would then go to your father's stepbrother, Elmer Calvroon, according to the terms of the will."

Graham's artificial limbs were so scientifically perfect that in one sense of the word he was not a cripple at all. He seldom used the heavy cane that he always carried with him. As the three of us walked the short distance back to the spacious, well-equipped laboratory that had been the elder Greene's, I made a remark about the rather unusual provision of the will, which gave everything to Graham, and yet said that should he die everything was to go to Calvroon. I was unable to refrain from speculating as to the motives of the man who had written that will. My remark caused my friend to break his thoughtful silence.

"Von, you know very well what is in that vault, the thing that Jameson so carefully avoided in his roundabout speech. You're an older man than I am, and undoubtedly you remember the events of ten years ago much better than I do. But I remember enough. When my father produced organic beings artificially in the laboratory, when he succeeded in the horribly complex task of the synthesis of protoplasm, when he found the secret of life somewhere in the phosphorus compounds, yet remember how his great work was received. Because he insisted upon keeping his method a secret, he was branded as a fraud by the scientists of the world, in spite of his recognized ability and his unstained reputation. The others could not admit the possibility of his accomplishment without incontrovertible proof and demonstration, which he withheld. They would not take his word. And he had his reasons for withholding that secret, Von!"

Graham continued in a tone that grew more gloomy.

"And the people of the world denounced him either as a fake or an atheistic, inhuman meddler in God's affairs, than which nothing could be farther from the truth. Fanatics made one attempt after another to kill him, believing him in league with the devil to destroy the world. Dozens of attempts were made to break into the laboratory and steal his voluminous notes and formulas. He killed one thief in self-defense.

"Then he put everything in that vault and destroyed all keys to it but one, which is in another vault. Few people know what Vault Number Three contains and fewer know where its key is.

"The world was no longer safe for Thornton Greene, branded as a fake by some and as a menace to humanity by others. After the sixth fanatical attempt to kill him, in which I myself barely escaped death at the age of sixteen, he disappeared from the world. But I know he's not dead; even though he's never communicated with me, he must be alive in some part of the world, with a changed name and probably a changed face also, safe from identification, still making his marvelous discoveries in half a dozen lines of science.

"The key will soon be legally mine. Unless my father returns or sends some message to me I am going to follow a plan I have long had in mind. For eight years I have been obtaining the best possible education along the lines of biology, organic chemistry, and related sciences. Most of the world thinks my father's records have been destroyed. That is what he wanted the world to believe. I hope I have qualified myself to understand and repeat his experiments, and to carry them further in secret. If I find any way in which his discovery will be of any benefit to the world I shall publish the whole process and vindicate him in the eyes of science and humanity. If I don't, I shall destroy every vestige of the notes, every shred of evidence. I think that is what he would have me do."

The next day we encountered the rhythmic toy.

Elmer Calvroon had been planning for months to kill Greene. I do not think it was the money he desired. It was that scientific secret in the locked vault, the secret of synthetic life. Calvroon was a scientist, too, and to his warped point of view it was absolutely necessary that Graham Greene be eliminated.

But he realized that he would be suspected at once should Greene be killed. The murder laws are strict. It was necessary further that Graham Greene be eliminated in such a way as to leave no possible clues to the manner of his death. It was highly desirable that his death should appear to be natural. Calvroon decided that he could not take a chance with any of the ordinary methods of murder. If he were ever to profit by the killing of Greene, the crime must be perfectly done.

The device which the sardonic scientist called the rhythmic toy was born in his brain from the union of two entirely different memories. One was the memory of the airplane crash that had deprived the tall heir of Thornton Greene of his feet. The other was the memory of a few well-proven physiological facts. He constructed the machine. After all, it was a simple affair, operated by a small electric motor.

On the early morning of April 8, 1999, when my friend was alone in his laboratory, he received a phone call from Calvroon, who invited him to come over to his laboratory and see a new invention. So Graham walked calmly into the trap.

To you who read this story, not having been acquainted with the two men for the long years I have, this action on the part of my friend may seem incredible. You may wonder why he did not suspect anything wrong. From my intimate knowledge of the men, I believe I can answer your doubts.

In the first place, Graham was not of a suspicious nature. In the second place, the invitation was so natural and aboveboard that it did not arouse any suspicion. In the third place, Calvroon was an inventor with 780 patents to his credit, and he was rather vain about it, in his cold, reserved way. It was his regular habit, when he had completed another device, to demonstrate it to his step-nephew before taking out a patent and selling the device to some firm that could use it. Several times, in company with Graham, I had visited the combination laboratory and machine-shop of Calvroon and listened to him explain, with that curiously suppressed pride in every tone of his voice, the principles behind some new addition to his large family of ingenious mechanical inventions, the details of its construction, its uses and advantages over the previous machine it had rendered obsolete. So on this morning Graham thought merely that his step-uncle had completed some new machine and was ready to demonstrate it. He went over to the other laboratory without the faintest shadow of a suspicion that Calvroon fully intended to kill him in cold blood in order to obtain those records and notes in Vault Number Three.

I had just finished a late breakfast and was idly wondering why Thornton Greene had equipped Vault Number Three with a key instead of the usual combination lock, for it seemed to me that the latter would have served his purpose well, when the Atom called me on the 'phone and announced that Graham was not at his laboratory, but had left a note for her saying that he had gone to Calvroon's.

The Atom was immediately suspicious of Calvroon. She had never liked him. She explained that Graham had expected her to arrive about noon, and had left the note in case he hadn't returned by that time. She had arrived early and had found the note. Then, she told me, she had telephoned to Calvroon several times without any of her calls being answered. She was anxious about her fiancé, and asked me to accompany her on a visit to the laboratory of the step-uncle to investigate. I agreed, for I could easily detect the fear and suspicion in her voice. I called Calvroon myself and got no answer.

I felt uneasy at once. Calvroon had always impressed me as a man who would stop at nothing to gain his ends. Suddenly it seemed quite possible to me that he was planning to abduct and kill my friend in order to obtain the key to life. A hard and selfish man, Calvroon. He wanted the secret all for himself. I don't think it ever occurred to him to ask Graham to share it with him. If he had, Graham would in all probability have refused.

After I had rung the bell and knocked on the door for more than five minutes it opened and Calvroon himself stepped out of his laboratory. Seeing the Atom and me, he inquired in a level, balanced, cold, and rigid voice, "What do you want?"

I invented some plausible fiction on the spur of the moment.

"I want to see Graham Greene," I stated. "An important message has just arrived for him and I must deliver it at once."

"You're lying, Von der Konz. Besides," he added almost hastily, "Graham Greene is not here." He turned on his heel to reenter the lab. The Flaming Atom flared up angrily.

"*You're* lying. He is here."

Before he could stop her she had darted past him into the laboratory. Calvroon turned silently and followed her, trying to slam the door in my face, but I was in as soon as he was. The Atom was throwing open a heavy "icebox" door at one end of the room, a door that was obviously soundproof, as was the room to which it gave ingress. Calvroon had apparently come out of this room to answer the bell, and had left the door open a fraction of an inch.

In two seconds the cold-blooded madman at my side produced a small derringer pistol, the type that fires those murderous mushroom slugs, from a cleverly concealed sleeve holster, and shot down the Atom. She fell in a little heap in the doorway. I made an involuntary motion toward Calvroon and found the little gun with the big bore looking me in the eye. Calvroon's eyelids drooped a little as he enunciated his threat.

"If you move one inch, Von der Konz, I shall kill you."

I did not move. I was not armed and I had seen enough to convince me that my captor would carry out his threat. I permitted my hands to be bound behind me with small but very strong metallic cords. Then I was efficiently gagged.

Calvroon's bullet had glanced off the Atom's temple, stunning her, but inflicting only a minor flesh wound which bled profusely. She regained consciousness just as the man with the gun finished binding and gagging her.

Then Calvroon took us both into the soundproof room. Graham Greene was there, gagged and tied to a chair. His face was a study in despair when he caught sight of the girl with the red blood slowly dripping from her temple. He made one mighty but ineffectual effort to free himself. Calvroon used the gun to persuade me to submit to being bound to another chair. Then he took the kicking, struggling, gagged girl from her lover's side and bound her to a third chair. Finally he stood off and regarded the three of us with an almost puzzled expression.

Then the three of us listened to an unusual speech. Calvroon calmly announced his intention of killing us all and then proceeded to explain to us just how he was going to do it—in precisely the same tone as he used when explaining some new invention. It was that suppressed pride in his accomplishments that caused him to tell us his plans. Some of what he said follows:

"When I first decided to kill you, Greene, I realized that it would be best not to use any ordinary method of inflicting death. Chemistry today is marvelously advanced. Any known poison could be detected. All deaths by violence are strictly investigated. And I realized that I would immediately be suspected because of the terms of that will. So I devised a method of killing you that will leave no possible clue to the manner of your death. When you are found in your own laboratory tomorrow or the next day no one will suspect that you didn't die of simple heart failure. If they do suspect, it will never be proved, for I am going to kill you scientifically without leaving the slightest evidence of that fact.

"I have recently been working on a number of improvements to the pipe-organ, and I had this sound-proof

room constructed because some officials of the hospital near by complained to the authorities about the various noises, musical and otherwise, that I was producing practically all of the time. This room permitted me to carry on such experiments without moving my whole laboratory, for the room is absolutely sound-proof.

"In the compartment in the wall behind that lattice-work you see at the left, which compartment extends also down into the basement, are several organ pipes which I was using a few months ago to produce very low notes for experimental purposes, some of the notes being so low that only vibrations were produced. This little switch in the wall, when I throw it, will start an electric motor which will compress sufficient air to play the pipes, though I am only going to use one note. The organ pipes together with an automatic device for gradually increasing the speed of the machine that plays them, constitute the invention I call my rhythmic toy.

"Let me explain a few facts about rhythm. Why is it that music affects a human being? Why does a snappy, rapid march make us feel energetic, patriotic? Why does a funeral march cause the average person to feel sad, melancholy, and depressed? How can we explain the effect of syncopated jazz?

"Part of the answer to these questions is in the music itself, the major or minor key, the sharps and flats, the tones of the instruments. But rhythm plays by far the greater part in it.

"The human heart has a strong tendency to beat in time with any well-marked rhythm. A rapid march has a strongly marked rhythm that is faster than the usual beating of the heart. The heart increases its speed to keep up with the regular boom of the big bass drum. Consequently, blood is supplied more rapidly to the brain and to the muscles. As a result the body and the mind are stimulated to increased activity by this supply of fresh blood. That's why a dance tune will set your toes twitching. Also, the increased flow of blood removes impurities from the tissues more rapidly, and the person feels more healthful and more energetic.

"The same thing is true of a funeral march. It too possesses a well-marked rhythm, but in this case it is slower than the usual beat of the heart. Involuntarily, the heart slows down to keep with it, and blood is supplied to the tissues more slowly. Therefore, the mind is sad and depressed, and the body dull and lethargic.

"The American Indians and other savages all over the world were accustomed to hold meetings about their campfires and chant their strangely rhythmic war songs to the accompaniment of the hollow note of the tom-tom, before starting out on the war-path. The individual who beat the tom-tom (although he was totally ignorant of the science involved), started at about the regular beat of the heart and slowly but steadily increased the speed until the savages, their blood surging through their arteries, had worked themselves into a frenzy of excitement and courage which they did not ordinarily possess.

"It seems that the lower the note, the greater the effect. In a band or an orchestra one does not notice the rhythm of the music of the trumpet or of the piccolo nearly as much as the rhythm of the bass instruments. The drummer sets the rhythm in a band.

"The machine that will play this organ pipe will produce short, rapid, low notes, all alike except that every fourth tone will be slightly accented. The speed will very slowly increase.

"If I started it at too great a speed, your heart could not go with it, but instead would beat with every other note, or every third or fourth note, as the case might be. So I shall start it at the average beat of the heart, about seventy five beats a minute, and it will slowly, very slowly indeed, increase in speed until five hundred or even more short separate notes are produced a minute. But that speed will hardly be necessary. Long before it reaches that extreme rate your weakened heart, Greene, will give way under the strain. You will be dead.

"Though my actual crime will be perfectly done, I am just now realizing that I have been grossly careless in the preliminary matters. I have permitted you two others to discover me with the greatest ease. I have been devoting too much thought to the technical side of the matter and not enough to the practical side. A failing of the scientific mind, I suppose—the so-called one-track mind. I should never have been so careless.

"It is obvious that your meddling must be rewarded by death. I strongly doubt that my machine will be able to work your hearts to death in the same way as it will Greene's, for yours are healthy and normal while his has been greatly weakened. You will probably be able to survive the utmost rate of speed I can obtain, but again you may not. I shall lose nothing by trying. It may save me the trouble and danger of disposing of you in any other way.

"It occurs to me now that perhaps I can put your bodies in a radio-controlled plane and crash it. Then it will seem as if Graham Greene died of heart-failure when he learned that his fiancé had eloped with his best friend. The shock of that double disloyalty will seem to have been too much for him."

Perhaps it was that incredible, inhuman pride that prompted him to brag to us of his clever way of killing us that made us hate him the most. Or perhaps it was the last part of his plan. The Flaming Atom and I were close personal friends; futhermore we were both racing pilots and had each distinguished himself by capturing a world's record now and then. Because Graham Greene was my friend and the Flaming Atom's sweetheart, our three names were often mentioned together in the newspapers. Calvroon's explanation of our presence in the crashed plane would have been very convincing to the public.

Calvroon said much more which need not be added here. We could do nothing but sit there and listen to him. Among other details we learned that he had been making the final adjustments on the machine when the Atom and I had knocked on the door. He had heard us only because he had happened to leave the door of the sound-proof room open.

Calvroon started the device and left the room, closing the heavy door. As near as I can judge, that was at three or four o'clock in the afternoon.

For three hours, three hours that seemed as three thousand eternities, I listened to the damnable, never-ceasing, steady, rhythmic, monotonous, hollow notes that ever and ever came faster, but whose speed increased so slowly I knew that the blood was rushing through my veins, but I assure you that I was not feeling either elated or patriotic. My surplus energy was being used up by the fear that I could not conquer, by my great anxiety for my friends, and most of all by my anger and hate. Mentally I cursed his soul to hell at least three trillion times.

It was at the end of those three terrible hours that Graham's head suddenly sagged forward and he was still. A strangled scream came through the Atom's gag and great tears formed in her eyes. I looked toward my friend, limp in the bonds that held him to his chair and I swore that somehow I would revenge him. I could almost read the Atom's eyes. In them, too, I saw that determination to get revenge. It had been such a cruel death, her eyes told me. Calvroon had taken advantage of the weakness of his heart to kill him, had tortured him for three hours after telling him how he was to die. I was soul-sick to see the love and pity in her eyes. There were love and pity in mine too.

All during those three hours the blood had been trickling down from the wound in the Flaming Atom's temple. The blood had not clotted very well. For three hours she had been bleeding, and the loss of blood soon weakened her. She sagged forward too, and I was glad.

She had fainted from loss of blood and the shock she had endured. The rhythmic toy had no power over her now. She did not hear it. I could see her bosom rise and fall with her slow regular breathing. The thought came to me that perhaps her wound was to save her life, that perhaps Calvroon had defeated his own purpose to a certain extent, by shooting her. Her weary, broken heart was at rest.

But mine was not. The unending throbbing hollow note filled the room with its reverberations. Always it was the merest trifle faster. Though I knew that it was useless, I used every last ounce of nerve force and willpower I possessed in vainly trying to control the beating of my heart, trying to make it obey me and beat more slowly in spite of the rhythmic monster. I sweated blood trying to make my heart obey me. It can't be done.

Then I tried to go to sleep, to outwit the rhythm that way. Did you ever try to go to sleep in a room next to a loud and never-ceasing jazz band, and lie awake hour after hour restless and uneasy, because of its rhythm and its discords? Then perhaps you can comprehend the merest trifle of the agony I endured, waiting for a rhythmic death.

I wondered if it were within the limits of possibility that Thornton Greene would return from his hiding and arrive in time to avenge his son and save the lives of the Atom and me, to say nothing of saving his precious secret from one who had no right to it. But that was a last desperate forlorn hope. Thornton Greene did not come back from the dead.

It was late at night when Elmer Calvroon entered again the sound-proof room. He saw my face and cringed a moment from the hate he saw there.

He collected himself immediately, however, and advanced toward the figure of Graham Greene, still hanging limp in the chair. His coming awoke the Atom and another choked scream came from her, as he untied the bonds. He paid no attention to her, and finished untying the thin, strong, metallic cords that held the tall young scientist.

Then with a dramatic suddenness that affected my heart more than any devilish rhythm could ever have done, the dead man stood up rapidly, firmly, and solidly on two scientifically perfect artificial legs and swung a beautifully clean and efficient right to the jaw that lifted his arch-enemy off *his* feet and deposited him recumbent on the hard floor.

Graham Greene ungagged himself and snapped off the rhythmic toy.

Then he released the radiantly happy Atom and his unbelieving friend with the guttural German name from their respective bonds and tied his step-uncle thoroughly, gagging him for good measure.

"Von," he said, "will you run in the other room and call up the police? I'd like to kill this fiend, but it's against the law." I lost no time in doing as he requested.

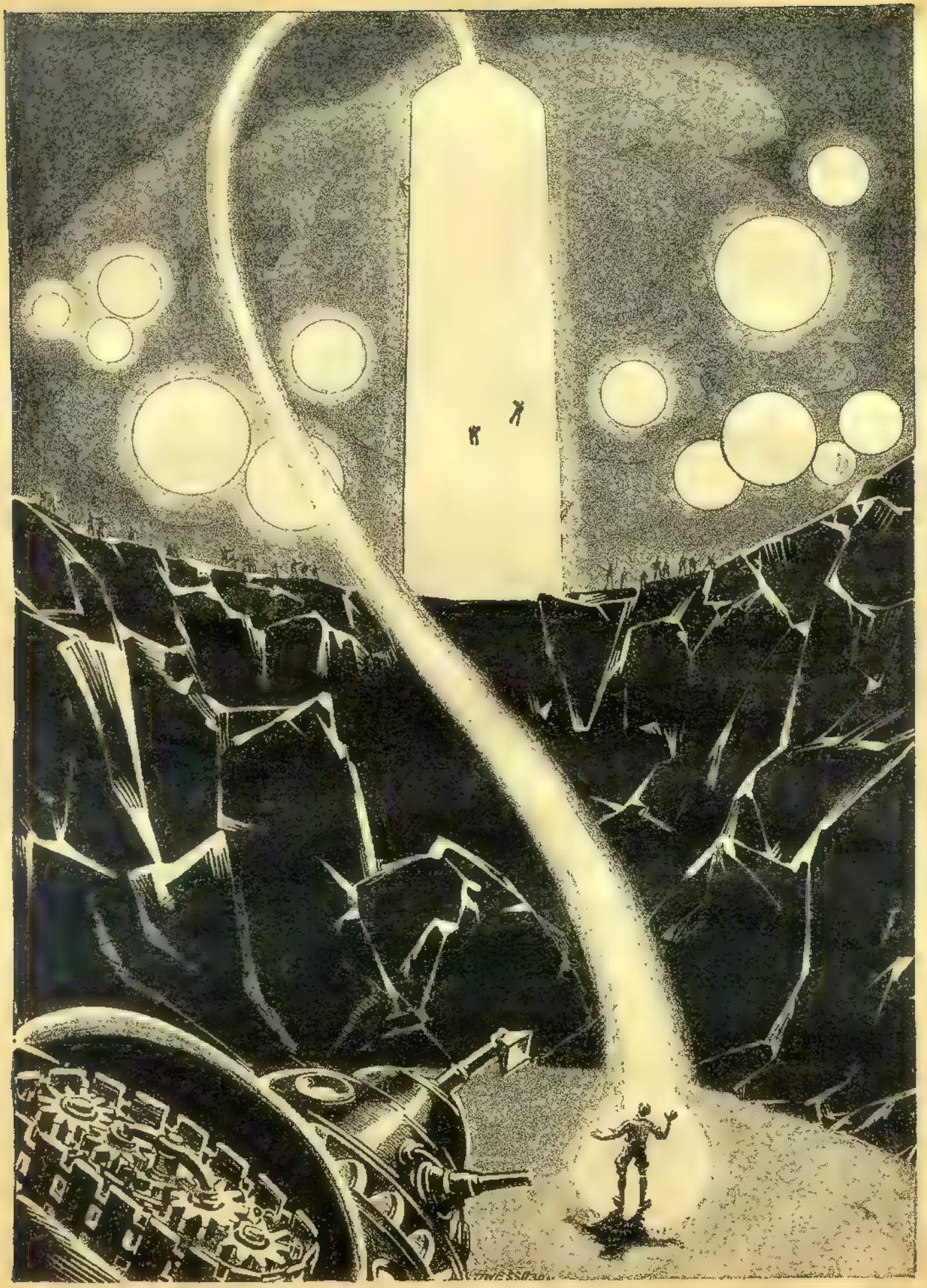
When I returned, the Flaming Atom was standing on a chair with her arms around Graham's neck. Love laughs at trivial differences in altitude.

Half an hour later, when the Atom finally consented to release him for a minute or two, he cleared up that mystery that had been puzzling me ever since he had cleaned up Calvroon.

"Von, my friend, I'm sorry if you thought I was dead when I dropped off to sleep there. That rhythmic toy would be deadly to most people. It probably tortured you terribly. There's not a thing wrong with the principle behind it. But for one thing, it would have killed me quickly.

"It's a scientific fact, Von, that some people can hear sounds that others can't. My ears are exceptionally high-pitched. I can hear the squeak of a bat and other shrill sounds that the majority of people can not hear. Calvroon chose the lowest note he could to be quite sure our hearts would stay with the rhythm, and it was just below the range of my audibility. I could go to sleep in perfect comfort, except for that gag, in a room that seemed to me to be as silent as the tomb."

THE END



¶ *That awful twisting beam of green flame reached out of the top of the thing and bent down over me! It touched me!*

The Green Girl

(A Serial in Two Parts) Part II

By

Jack Williamson

Author of "The Metal Man"

Illustrated by WESSO

IT must be generally conceded by anybody who has thought about the subject at all that there are many forces absolutely unknown to us. How, then, can we tell with what driving powers and activations these forces might be imbued? Or what inimical dangers might be hidden within them? In the concluding chapters of this scientific classic, which might unhesitatingly be numbered among the very best ever published, the author continues the accelerating pace set in the first instalment. And the story is full of sound science, so cleverly interwoven with good fiction, that it reads like "The Moon Pool," for the author possesses not only the art of writing, but excellent imaginative pawers as well.

WHAT WENT BEFORE

"AT high noon on May 4, 1999, the sun went out." Thus starts the story, as told by Melvin Dane, foster son of Dr. Sam Walden, famous scientist and sole savior of the world, who alone knew of the impending disaster.

When the sun goes out and the world begins to freeze over, Sam Walden and Melvin Dane embark on the scientist's specially prepared vessel, which is equipped to fly through the air, travel on land, and sail on the ocean and under its surface equally well. They head almost straight down through the Pacific to the ocean bed and find themselves in a sub-sea city. By the use of certain radioactive gas which negatives the gravity of the water, the ocean is held as a sky or ceiling over the place. They find in this city obvious signs of habitation—green grasslands, which are here and there marked with huge, strange splotches of purple woodland; and coming toward them are large winged things, which on closer examination are seen to be a sort of enormous, monstrous, flying thing, that carries on its forward end, in place of a head, a huge, many-petaled flower. One of these creatures holds in its tentacles a human form, which upon extrication by the two men, proves to be The Green Girl, Melvin Dane's dream girl. Way back, in his childhood days Melvin accidentally hits on a wave length which gives him talking contact with a girl-child from a strange land, with whom he seemed, over the radio, to have had many adventures. So they grow up together, she in his dream world, and he on earth.

When they free her from a metal box clamped on her back by means of two metal bands, she recovers consciousness and recognizes Melvin. She then tells them she is Xenora, a princess of the old City of Lothar, and that she had been captured and enslaved by that most terrible of menaces, "The Lord of Flame."

CHAPTER XVII

The Lord of Flame

I MUST have stood there many minutes, lost in fearful reverie. Unconsciously I heard Sam and Xenora moving about below, heard faintly the murmur of their conversation. At last my grim forebodings of the horror that was to come were interrupted by Sam's cheerful hail, and I went below. I came upon Xenora in the cabin. She was arrayed in a fresh suit of my white flannels that Sam had laid out for her; and evidently she had been under the shower, for drops of water still gleamed on her dark hair. She looked freshly, incredibly beautiful, dressed even as she was.

I must have flushed somewhat, for she laughed at me. But she showed no anger or displeasure—she had not resented what I had done. She looked squarely at me with those cool violet eyes that shone with humor and human feeling. I read honest understanding in their clear depths, and suddenly I went to her and held out my hands. She took them in her slender ones.

Presently we went in together to Sam's wonderful feast. He had the little dining room spick and span as usual, with the windows screened and the white lights going to shut out the terrible red glare. It was very cool in the soft breezes from the fans, and we three sat down in comfort to the delicacies he had prepared.

Sam still remembered what I had taught him, so many years ago, of Xenora's language, so that he was able to converse in it. "It'll be some revelation to the old deadheads at the Academy if we ever get back and publish our account," he said. "They have never admitted telepathy, just because the phenomenon of thought transference depends upon such delicate attunement of minds that it cannot be reproduced at will. Of course, we don't know just how much the radio had to do with it in your case. Undoubtedly it served as a carrying wave, at first at least. But anyhow, it would be some bombshell to toss among my old associates!"

"Who cares what they think about it?" I said. "We've found her. That's all that matters!"

Xenora sat down eagerly. I found joy in watching her eat. She manipulated her unfamiliar fork with instinctive culture, and seemed to like Sam's viands immensely. And she ate with the restrained eagerness of one who has not touched food for some time. What misfortunes had the brave girl been through?

Presently, when she was somewhat satisfied, Sam began questioning her in an effort to find out something of the strange world about us. "Where do your people live?" he began.

"Once Lothar was an empire that girdled the central sea. But many lifetimes ago the evil power of Mutron

arose, and our people were conquered by the slaves of the Lord of Flame. Now there are but a handful of my race, living in the forests by the northern cliffs. And even they are taken to serve the Lord of Flame——"

"The Lord of Flame! What is that?" Sam cried in amazement.

"It is a dreadful thing—a serpent of green fire that dwells in the violet mists of the chasm of Xath," she said hastily. "But let us not speak of it. No man speaks of the Lord of Flame, for it hears—stay! Oh, horror! Do you not—feel it?"

And indeed, at her words, I felt a strange and alien thrill, as if the revealing searchlight of some dreadful power had been suddenly thrown upon me, as if some strange wind of fear had blown upon my soul. I shivered involuntarily, and crouched closer to the others, trying to drive the horror from my mind.

"God!" Sam breathed hoarsely. "What can we be up against?"

In a moment the girl went hurriedly on, as though to change our thoughts to other things. "Many sleeps ago I was taken by the men of Mutron, and put in the power of Xath. They sent me on a ship to fight the Lunaks. We fell in with a vast number of them, and they brought the vessel down. The fire-crystal was torn from my back in the wreck, and I was free. I ran for the trees, but the Lunak caught me. And that was the last I knew, until I woke, from my dream of—of——"

She turned to me with a little smile, as if such weirdly incredible adventures were to be taken as a matter of course. I could not speak for the pity and horror that were mingled with my admiration for her courage. But I could, and did, reach under the table and take her hand. Thereafter each of us contrived—after a fashion—to eat with one hand.

That brief and puzzling account of her adventures was all that Xenora was able to give us until experience would enlarge our common vocabularies. Certainly it offered plenty of food for conjecture. She had little scientific knowledge; and when Sam continued his questions, the accounts she gave of the origin and meaning of the strange things she mentioned smacked more of myth than of history.

"Has the Lord of Flame always been, Xenora?"

"No," the Green Girl answered. "Back in the beginning, ten thousand lifetimes past, the men of Lothar ruled, and there was no Mutron to carry them to Xath. The warriors of Lothar were very brave. They fought the Lunaks, and hunted the beasts of the plain. The kings of Lothar reigned in a hundred cities that ringed the central sea, and there was food and joy for all.

"But the Lunaks were very wise. When the great men of Lothar brought weapons of fire to fight them, they went into the jungle and laid an egg, and guarded it, and there sprang up the Lord of Flame! It is a serpent of green fire, as thick as a mountain and as long as a river! All the warriors of Lothar went to meet it, and it slew them with a breath of fire! It took slaves of our people and carried them into the fire-pit of Xath.

"And from that day, through countless lifetimes, our people have been worshipers and slaves of the Lord of Flame. Those who are taken are no longer as men, but as sleepers walking, with the fire-crystal on their backs. They fly in ships of Mutron, the City of the Sleepers, and rule with a heavy hand in the name of the Lord of Flame. None escape them!"

"Well, I'll be d—er—flabbergasted!" Sam exploded. His face was a study. Incredulous disbelief was there, and amazement, and something of fear and horror, too. What the girl said had all the earmarks of a fairy tale. But we had seen the metal upon her body, and the purple stains—and we had felt that sudden, inexplicable wave of fear.

"Is it possible? Mel, it can't be! It's too fantastic!"

I could make no answer. "And you, Xenora. You were taken by that thing?" I cried in sudden horror.

"I was taken in a ship, and carried to Mutron, the City of Fear. There they fastened on me the fire-crystal. Then my mind was in a sleep, and my limbs did not what I willed. Until the ship fell my life was a nightmare of toil and terror. The Lunak took me, and I knew nothing until you found me."

Xenora still seemed rather weak and tired from her terrible ordeal. After we had eaten, Sam and I conducted her over the ship, with a view to convincing her of the wonderful power of the machine and thus to quiet her fear of that mysterious menace. We started the engines and moved the machine a little. I fired the gun for her edification, to show how the monster had been killed, and Sam showed her how to blow the siren, and even let her pull the cord. Then we took her back to a stateroom, and turned it over to her.

As she went into the room, Sam proposed that he and I go hunting. His real object, I think, was to get some fresh meat for the little winged plant, but we wished to learn as much as possible of the fauna and flora about us.

I was not eager to leave the machine, but we were armed with the best of weapons, and there seemed to be little danger. Then, we intended to be gone only a few minutes. When we were ready to start I tapped on Xenora's door, to tell her that we were leaving, but she made no answer. I suppose that she was already asleep.

We climbed up on deck, and closed the hatch behind us.

CHAPTER XVIII

Lost in the Purple Forest

WE WALKED off east through the level green meadows, beneath the scattered trees that were bright with purple bloom. For my own part, I was much more interested in the vegetation than in any game we might come upon. In fact, I would not have been greatly disappointed if our hunt had been in vain.

The leaves of what I have called grass were really so wide and thick that it was hardly grass at all. The higher stems of it bore myriads of tiny, bright-red flowers. The great trees were, in shape and foliage, somewhat like the oak, though the rich profusion of the purple flowers almost concealed the leaves. They bore small fruits, in appearance a little like the date, which, as we were later to learn, were edible. But, in all the time I was in that strange world, I found no single plant that was exactly like any I had known above.

Indeed that was a strange hunt, under a flaming scarlet sky, nine miles beneath the ocean, through forests of the purple trees that burdened the air with their unfamiliar fragrance, in search of we knew not what in the way of game.

We tramped steadily eastward over the green meadows for perhaps half an hour, rewarded with the sight of no living thing. The Omnimobile had long been out of sight. We crossed a low greasy ridge and made our way out across another broad smooth valley.

At last, as we looked from a screen of brush at the edge of a little meadow, we saw an odd-looking creature gazing unalarmed a hundred yards away. It was somewhat larger than a hog, with gray, hairless skin and long white tusks or horns. It had an oddly heavy, barrel-like body.

It must have winded us, for it threw up its head with a peculiar squeal, tossing its great tusks. Sam and I both fired. We have never agreed which of us hit it, but it slumped over on the green vegetation. We hurried up to it. It was quite dead. It had great claws, and somewhat resembled a sloth, although it was exactly like nothing that I had ever seen.

Sam took out his knife and skilfully removed half of the skin, wrapping up a piece of meat in it. The beast had thick rolls of fat along the back, but the flesh beneath looked so nice and tender that he took some of it to try for steak.

"We'll try some of it broiled when we get back," he anticipated, smacking his lips.

"Let's hurry on," I said. "We've been gone longer than I intended, already. What if Xenora wakes up and we're not there?"

"Let's see." Sam said doubtfully. "The wind was from the south, wasn't it?"

I looked around in sudden panic. I was almost sure that I knew the way back to the machine—almost!

The strange world about us was suddenly very alien and cruel. The plains were lonely and flat and dead. The trees were suddenly wild and mysterious, as if they concealed strange monsters. There was a ghastly, unearthly menace in the red gleam of the sky.

In all directions the country looked much the same. There was no definite landmark. We stood there for a time, scanning the unfamiliar panorama, in the beginning of panic. There were half a dozen groups of trees, any of which might have been the one from which we fired. It occurred to me that it would be very inconvenient if one of the flying plants came along, and I began to think of other things that might happen. I came to a tardy realization of our helplessness and utter ignorance of the dangers that might surround us.

The purple trees and the scarlet sky seemed to leer at us, to gather closer, to laugh in fiendish joy at the unnamable doom they might have in store for us. Unconsciously I drew my pistol, and my muscles were involuntarily tensed, so that I started when Sam spoke.

"Of course we can see the wall of cliffs in the north. That will give us the general direction. If we can get up on that hill, we might be able to see the machine."

He pointed toward a round, bare, green hilltop that rose several hundred feet toward the red sky. It was perhaps a mile away, in the direction of the hazy blue cliffs. He slung the piece of meat over his shoulder and we set out over the open field. It was very hot, and the perspiration was dripping from us. I had hardly noticed the damp, hot wind before, but now it felt like a blast from a furnace. The intense scarlet radiation of the flaming sky dried up our energy. The steady beam of heat brought over us a growing languor, a depressed and spiritless weariness.

The whole weird region was very still. The only sounds were the soft sighing of the wind in the trees, and the thrashing and rustling of our feet in the rank grass. The tiny scarlet flowers danced before the wind almost like little insects, and a few brilliant petals blew sometimes from one of the sparsely scattered trees.

"Phew!" Sam whistled, stopping to mop his brow with the huge red bandanna he had tied around his neck. "This is beginning to feel like the Sahara! I'm glad I didn't happen to be a native of the place! You bet the machine will look good, when we find it!"

"If we find it," I could not refrain from saying.

In five minutes more we were far up the side of the little hill. The side of the eminence was bare of the great flowering trees; so the strange forest lay about us southward for many miles. Eagerly we looked in the direction that should have been southwest, for the Omnimobile.

A vast stretch of the rolling plateau lay before our eyes, low verdant hills, and vast green meadows, scattered with the brilliant purple trees, singly and in groves. Far away, all across the southern horizon, stretched the black sea on which we had landed, glancing with the crimson light of the sky. But nowhere, in all that vast strange expanse, did we catch a glimpse of the machine.

"It must be just in a low place," Sam said hopefully. "Or, I think I remember now that there was a little grove just north of it. We will see it in a minute, if we climb higher up."

"I hope so," I said, raising my binoculars for a better look.

"And we have compasses and instruments to guide ourselves around the world, if we'd just thought to bring them!"

"It's no use!" I said. "Let's go on to the top."

CHAPTER XIX

The Hill of Horror

WE CLIMBED up the last few yards to the summit, and gazed across toward the dim blue cliffs that rimmed this world on the north. We stood on a great divide. A vast valley lay before us, stretching away until it was veiled with a faint rosy haze. The curious checkered expanse of green plain and purple woodland sloped far, far away to the north. Perhaps twenty miles away was the vague outline of a great silver lake, dyed with the light of the crimson sky.

Just back of the lake seemed to be a shore of low black cliffs. And beyond those ragged peaks, and beneath the towering and rugged columns of blue that threw themselves up to the bloody sky, was a strange sight indeed!

There was a weird flicker of dancing lights in that far-flung crimson mist, as if it reflected strange infernal fires in a pit behind the low black wall. There were faint and moving gleams of violet—of pale violet flames that changed and rose and fell. Vague tongues of violet fire wove themselves throughout that distant rose-colored mist, with a writhing, rhythmic motion. They formed curious shapes of flame, that faded strangely and came again!

But my description is futile. The important thing was not what we saw, but what we *felt!* A curiously unpleasant sensation of helplessness, and of

strange horror, came over me. I felt as if I were stealing a forbidden glimpse of an ancient and incredible hell! Fear swept over me—alien, inconceivable terror—like a keen and bitter wind that numbed my brain! I felt the horror of a sentient force, utterly inhuman, devoid of all human knowledge or understanding, as cold and remote as the frozen night of space!

It was terrible—an intangible *aura* of fear that reached out of that pit and tugged at our souls with the icy hand of stark horror! I can give the world no conception of the overwhelming terror of it! Nor would I if I could, for such things are better forgotten. I dropped my rifle and clenched my hands, trembling. I braced my feet as though against the force of a physical wind that was striving to carry me toward that abyss of nebulous horror-light!

I looked at Sam. He stood very still, leaning back, with hands raised and jaw dropped. In his eyes was the look of the fresh and innocent soul that struggles with a pitiless terror that it cannot know or understand! Such a look I had never seen before—and God grant that I may never see it again!

My gaze was drawn irresistibly back into that mantle of moving light. Even as I watched, a pillar of green flame, very bright and broad, thrust itself up through the wavering mist of violet fire, and into the crimson haze. It was like the slender head of some obscene green reptile. It reached up—incredibly! It writhed and twisted about! It *was* like a great serpent of fire. And it *saw* us!

It grew still with awful attention. Eternities seemed to pass as the dreadful thing hung there, motionless, like a vast frozen pillar of twisted emerald flame, like a column of curdled green fire, with curious throbbing changes in its brightness. I felt a weird force flowing out of it. And I knew that it was *watching us!*

"My God!" Sam muttered. "My God!" I looked at him again. His thin face was very white, and beaded with perspiration. He was mechanically mopping at his forehead with the red handkerchief, and staring at the mist of flame with the glaze of terror upon his eyes.

I struggled mightily to throw off the spell of amazement and terror—of alien and unutterable horror—that was grasping at my mind. It was a heart-breaking effort. I moved. I seized Sam's arm and shook it. He swayed drunkenly, with his eyes still on the awful lights. He was like one in a trance—like a man in a dream of death!

And I felt those icy fingers of unthinkable doom closing about my own mind. I was paralyzed again, with my eyes drawn back to the north. The snake's head of frozen green still throbbed strangely, and the flickering violet aurora still kept up its storm of varying motion, in the dim rosy haze into which the awful head was lifted.

Something was reaching toward us, out of the pit! I knew there was intelligence in it—a *will*, inhuman, and unthinkably strong! It was calling us, compelling us! I knew that in a few moments we could fight no more.

Suddenly a low sobbing sound reached us on that warm, humid south wind, a sound that wailed uncertainly behind us, and rose to a piercing shriek, and slowly died away into the distant south, echoing weirdly on hills and trees as it rolled and sank.

Sam started with a hoarse cry, and went off down the hill toward the north at a stumbling run—toward that abyss of alien horror! A moment more I struggled desperately, but that pitiless power overwhelmed me! I followed in his tracks!

And then, a clear rich voice reached me from beyond the hill—a shout in Xenora's rich and ringing tones. It had a clear human overtone of confidence and courage. "Come back, Melvin Dane! Come back, Sam!"

The old scientist stopped uncertainly, passing his hand dazedly before his brow. Abruptly the terror was gone from my mind! The love and the courage of the brave girl flowed into me. And suddenly, with the green light still pulsing through it, as though sent by a mighty heart, the terrible thing in the north dimmed slowly and faded away! Still the violet lances flickered through the rosy mist, but the green thing was gone—and we were free!

I took Sam's hand, and we turned our backs on the amazing play of fire above the incredible pit, and hastened to the trees from which Xenora's voice had seemed to come. We reached the little grove, but I did not see the girl. Suddenly I had the persuasion that I had not actually heard her with my ears, after all!

"Xenora! Xenora! Are you here?" I called uncertainly.

Sam was still trembling and mopping at his forehead. "She wasn't really here, I think, Mel," he presently said in a strained voice. "She must have reached us with telepathy."

For a long time then we stood there under the flowering trees—very close together, feeling all the awful mystery of the strange world about us—and thinking of what had happened.

"What was it?" My silent lips at last formed the question.

" 'The Lord of Flame!' Xenora said. 'The Lord of Flame!' 'A serpent of green fire that dwells in Xath below Mutron!' " Sam repeated mechanically. "I would to God I knew what it is!"

"And what was that awful sound?"

"That was the siren of the Omnimobile, I think. You know we showed Xenora how to operate it. Probably that saved us, by attracting our minds from the Thing while Xenora reached us."

"Then if we go toward it——"

At the instant the wild, sobbing shriek rose again, very welcome for all the wailing qualities of its tones. In a moment we were hastening down the green hillside among the purple trees, in the direction from which the sound had come. Twice we heard it again. And in half an hour we saw the glint of the silver metal side of the machine beyond a thicket of purple bloom!

I have seen few more welcome sights than the Omnimobile was then. The heaviness of it, the threatening nose of the little gun, the air of irresistible power about it, and even its clumsy, beast-like appearance were reassuring. Sam gave a cheer, and we made the last hundred yards at a run. At last we stumbled up the metal ladder and stood upon the narrow deck again.

We clambered through the manhole. The white electric light of the interior was in strange contrast to the crimson gloom, and the coolness of the air was very refreshing. Xenora was in the cabin, anxiously on her feet.

"It was the Lord of Flame!" she whispered. "And you escaped!"

"Thanks to you, my dream girl," I said, taking her boldly in my arms.

CHAPTER XX

Sam's Pet

"I FELT it watching you—calling you—and I pulled the cord that makes the great cry," Xenora whispered, after a long, long time.

"Thank God you did! It saved us! We were lost!" And I told her of the amazing storm of flames, of the Thing that had risen out of them, and of the irresistible spell of terror, from which she had awakened us.

"Yes," she said. "It was the Lord of Flame. He watches the world from Xath. He knows the acts of every man!"

I must have reeled a little with fatigue, for suddenly the girl looked at me with quick sympathy brimming in her eyes. "But you—my white prince of dreams—you are very tired. You must rest."

Abruptly I realized that I was tired, dead with fatigue, with an unutterable weariness not only of body but of mind, for the horror had exhausted my emotions. I heard Sam splashing water under the shower. I followed him to the bathroom, and then went to my bunk in the stern, for I had given Xenora my stateroom. I was leaden with weariness, but peacefully secure in the protection of the heavy metal walls of the Omnimobile.

I have very little idea how long I slept, for we had let our watches run down. In the absence of the sun, we came to pay less and less attention to the time, though we usually kept the chronometers going.

When I woke I felt greatly refreshed, with my terrorized despair almost gone. But I would not forget the sense of evil and intelligent power that I had got from the pillar of strange green fire that had been thrust so deliberately and purposefully up through the mist of violet flame, and into the rosy haze that hung over the hidden abyss in which it lurked.

It had *seen* us! I knew it. And I knew that, even if its incredible power seemed withdrawn, it was still not far away.

I heard Sam speak, heard Xenora laugh. Evidently they were in the little galley, for I heard the clatter of cooking utensils. I dressed and went in. How beautiful the girl was! Her red lips were brilliant against the light green tan of her skin. Her dark hair fell over her shoulders in a rich cascade, and her violet eyes were sparkling with life.

She came to me quickly, and took my hand. No words passed between us, for our minds were too near together to need many words. It was enough for me to see the sympathy and love in her eyes. And it seemed again, when our hands met, that a subtle current flowed back and forth between us, setting our minds alight, making our hearts beat faster, raising us together into a higher ethereal plane and fusing our beings into one!

In a moment Sam, with a kind smile of understanding on his face, called us to the table. The steak from the thing we had killed was a great success, and the table was loaded with the good things with which the larder of the machine was stocked. The girl ate heartily, as did Sam and I, and we talked and laughed a good deal. Even if the small number of our common experiences limited the topics of conversation, we had a merry enough time of it, and somehow that happy meal gave us greater courage to meet the strange menace that rose before us.

After we had eaten, and all had helped wash the dishes, all in the same gay spirit, Sam got out the box in which he had put the little creature he had named Alexander. I had quite forgotten all about the diminutive winged plant. With mingled curiosity and repulsion I watched him unfasten the box. I had not yet recovered from my instinctive horror at sight of the flying plants. Xenora seemed to share my antipathy toward them. But Sam has always seemed to care as much for wild life as for men; and he seemed to consider the little creature as natural a pet as a dog. However, of course, his real reason for keeping it was for scientific observation.

The thing fluttered about in the box when he picked it up, and as soon as the lid was raised, it flew out and lit on his hand. Already it seemed bigger and stronger than it had been a day before. The pale yellow of the little fish-like body was darkening. The wings seemed a darker green, and stronger. The blood-color of the slender tentacles along the sides of the body was growing deeper and deeper.

The weird little monster clung to his finger with three of its tentacles, holding the thin, petal-like membranes about its head extended, and moving its black, knobbed organs restlessly. At first the color of the flower-like tissues was almost white, but when I made a sudden motion, they quickly darkened to a deep violet, and the little creature crouched down in Sam's hand as if it were alarmed.

Sam smiled down at it with real understanding in his face.

He uncovered on the table a dish containing a great chunk of the raw, bloody meat of the thing we had killed. The queer, flower-like head twisted about, and the black, stalked organs moved like eyes. Abruptly the membrane changed color again, from the violet of its fright to a deep red.

Sam held his hand over the meat and the slender tentacles disengaged themselves and writhed down over the plate like tiny red snakes. They began to suck the juices out of the meat, and, as the thing filled itself, the strange flower slowly faded in color, until it was a pale pink.

Observing my instinctive horror of the thing, Sam said: "That's the way it was meant to eat, Mel. Nothing unnatural about it. Our table manners might not seem very elegant to an angel!"

"I guess you're right. But that thing just gets on my nerves."

When he went to put the little creature back in the box, it clung to his finger as if reluctant to go, and strange bright patterns of color flashed over the thin membrane. It seems fantastic enough, but even then I was sure that the little thing possessed intelligence, and that it was beginning to feel affection for Sam.

The next time he took it out it seemed larger and stronger—and hungrier! We stayed there for what must have been ten days, though we kept no accurate account of time. It grew rather astonishingly, and always its odd appearance of intelligence was greater. It seemed to feel a real affection for Sam. He whistled ancient tunes to it sometimes, and it seemed to listen in great delight. And for long hours he would sit with the thing in his lap and talk to it. He declared that it was getting so that it could understand. Bright colors crawled on the membranous fringe, and it seemed to listen to him with great intentness.

CHAPTER XXI

Back to the Haunted Hill

ON THE morning—if one may speak of morning in that world of eternal day—after we had slept off the fatigue of our visit to the hill where we had seen the lights of terror, Sam took me aside for a short talk.

"Mel," he said, "we can't forget what we've come here for! My generator is still keeping up the interference in the ether; but, sooner or later, the force we have come to fight—and it must be that 'Lord of Flame' of Xenora's, and the thing we saw from the hill—will break down the interference! And then the earth—will freeze!"

"But what can we do against—that? And Xenora! Sam, I can't leave her. She's worth more to me than the earth! There's plenty of room in here for us to live our lives out. I've been thinking about it—and I can't go!"

He nodded sympathetically. "I know, Mel. She means a lot to you. But perhaps we will win and save our lives, too."

"Not a chance!" I said bitterly. "Not against that thing we saw! It means death—or worse! But I suppose we have to go on and do our best!"

The old man was beaming. He patted me on the shoulder. "I knew you would be with me, when you had time to think," he said. "Now, when the life of the world is at issue, we can't consider ourselves."

"What do you think we can do?"

"What can't we do? We have the Omnimobile. We have machines and tools. We have knowledge, and our hands. We can go anywhere, and do anything! But the first thing is to study, to find out what we have to deal with, and how to fight it."

"I suppose so."

"Mel, we must go back to that hill."

"No! no! Not there! It was only a miracle—and Xenora—that saved us before!"

"I've some theories. We'll be better prepared next time."

A sudden thought struck me. "Say, couldn't we pay a flying visit to our own world again, and tell what we've found? Then the world would still have a chance, when we are—gone. A half-million Americans, with tanks and heavy artillery, would look mighty good down here. And it would just take a day or two to go."

"No," Sam said. "The world would hardly believe it all, even if we carried out what evidence we could. And nothing could be done in time. Then, I'm not sure we could get out. In fact, I'm pretty sure we couldn't. The rockets might carry us three miles high, all right; but we could never break through that water from beneath. We would fall back. Mel, it's up to us!"

During the days that followed, Sam spent most of his hours in the little laboratory. He spent much time on those great machines that controlled his forces in the ether. And he invented and developed another device that was more nearly within my understanding.

"You know, Mel," he said one day, "I think I can rig up something to protect us from that—fear—that came so near getting us. Ever since you made your telepathic contact with the Green Girl, I have had the idea that the brain sets up disturbances in the ether. We know that the action of the nervous system is electrical in nature, and all electric discharges set up ether waves. It happened that you and she had great minds, created in perfect synchronism, so that each was sensitive to the vibrations of the other. Hypnotism is best explained by such electric theories.

"Now, I am convinced that the 'Lord of Flame' is a brain—whether in a human body or not I cannot attempt to say. It creates such powerful etheric disturbances that it was able to affect us at a distance. If that is the case, it ought to be a fairly simple matter to provide insulation against its vibrations. You know that induction or electric action cannot penetrate a conducting cage. I ought to be able to fix a conducting helmet that will prevent the induction of neuronic currents in our brains."

A short time after he showed me three helmets, as he called them. They were little more than bags of wire gauze to be put over our heads. He demonstrated that an electroscope draped with one of them remained entirely unaffected by charges brought near it; but it seemed a ridiculously inadequate protection against that terror.

We went hunting several times, for the benefit of the little plant. After the first few days, Sam let it go along, hanging on his coat. It was growing very fast, and developing remarkable characteristics. It showed surprising intelligence. Sam seemed to have a real affection for it, and it, in turn, seemed to love him.

I never ceased to feel the strangeness of those expeditions over the rolling green grasslands, among the sparsely scattered flowering trees, in the hot damp air and the intense red light. We shot two more animals like the first, and three others of a smaller variety, which somewhat resembled large rabbits.

Very shortly after Sam had perfected his electro-screen helmets, he planned another expedition to the hill where we had so nearly met incredible disaster. We carried a telescope, electrometers, spectroscope, and a few pieces of Sam's recently developed and highly complicated apparatus, which he had neglected to name, for detecting and analyzing etheric waves.

Xenora insisted on going with us, and there seemed no reason for leaving her behind, since Sam had perfect confidence in the efficacy of his new helmets, and since the girl herself was an excellent woodsman, and could undertake to keep us from getting lost.

We had a long hot march of it across the green plateau among the purple trees, with the fierce beams of the crimson sky pouring down upon us. Burdened with the heavy instruments, we were worn out when we reached the summit. I had suggested that we come in the machine, but Sam wanted to keep it out of the sight of the weird enemy we fought.

Once more we gazed across the vast valley of purple and green, to the mists of ruby light over that abyss beyond the distant lake, in which the violet beams still danced and pulsed. And hardly did we have our apparatus set up when we saw that unearthly, serpent-like beam of green fire writhe up out of the vale of mystery into the rosy haze!

We had on the insulating shields, and I felt nothing of the inexplicable horror of the former occasion; though, of course, the whole adventure was certainly terrible enough. But now that strange thing of green seemed distant and devoid of menace. By way of experiment, I ventured to raise my helmet. The terror

caught me like a cold and rushing torrent that swept me almost off my feet! I was glad enough to get the wire gauze fastened back about my head again.

"It is the Lord of Flame," Xenora cried, "looking over toward the city of my people, to see who will be taken to become his slaves. This is a wonderful thing, Barsoni Sam, that lets us not feel its power!"—Barsoni being a word that means 'great man,' in the tongue of Lothar.

For many minutes the amazing shape of twisting green radiance hung in the air. Sam was busy with his apparatus, squinting at the thing through telescope and spectroscope, and reading his other devices. At last the awful, throbbing thing faded away, and died into nothingness. Only the violet lances were left in the mist.

"Many of my theories were substantiated," Sam informed me, almost jubilant. "And I got a lot of new data! It is rather odd, but the light from that thing shows the helium lines as luminous bands, not as the dark lines that might be expected to rise from the absorption of the helium in this atmosphere! I can hardly understand it!"

He said nothing more, but was sunk deep in thought as we quickly gathered the instruments and hastened silently down the hill. I felt that he had won a notable victory in the invention of the thought-insulating helmets. We arrived at the machine again without accident.

CHAPTER XXII

The Silver Sphere

FOR several days longer, Sam continued his labors in the laboratory. During that time "Alexander," the flying plant, developed remarkably. Before we moved, it had a wing-spread of two or three feet. I have spoken of its intelligence. It soon learned to flutter to the guns when we were preparing to hunt. Sam talked to it incessantly, and declared that it could understand him. He said it could even make its thoughts known by the varying pattern of colors on its fringe of brilliant membrane. Presently he had it trained to dry dishes and to do other similar tasks in the galley.

Of course the thing never learned to speak. In fact, it was devoid of vocal organs, and incapable of making a sound, though its hearing seemed to be good enough. It appeared to communicate its emotions and thoughts by means of changes of color in the tissue-like membrane that I have termed a flower. And, from a strictly scientific point of view, communication by light, or sight, is quite as logical as communication by sound.

Sam examined the black, rod-like organs projecting from the flower on the thing, and said that each of them bore thousands of tiny eyes, like the compound eyes of an insect.

After we had been in the vicinity for perhaps two weeks by upper world time, we started the Omnimobile's great motors again, and moved northward. I had not told Xenora about my talk with Sam—our minds were too closely attuned to require much conversation. I knew that she understood that our maneuver would probably mean our sacrifice to the cause of the world. She said nothing of it, but I thought I detected a sadness in her manner.

During all the hours that Sam had been in his laboratory, alone or with Alexander, I had spent most of the time with Xenora. We wandered together about the meadows, or sat in the cabin to escape the almost intolerable heat. Always I loved her more, brimming as she was with humor and sympathy and love. And bitterly I cursed the fate that was dragging us both to our doom!

Even at the beginning, Sam's scientific achievements had been so far above my understanding, that I would scarcely comprehend them, and his later speculations regarding the menace of the abyss were so abstruse that I quite failed to follow them. His little workshop forward was crammed with strange machinery, some of it humming incessantly. Indeed, his apparatus was still keeping up the interference that prevented the freezing of the earth!

Sam had been signally unsuccessful in getting any scientific information from Xenora, for the simple reason that she had none to impart. But, from her geographical knowledge, he attempted to draw a map, showing the locations of Lothar, of Mutron, and of the pit of the Lord of Flame.

It seemed that there was a strip a score of miles in width between the farther blue walls of the abyss and the great lake we had seen. The pit of Xath seemed to be a great crater lying in that strip. On the brink of the crater Xenora located her "City of the Sleepers," or Mutron. The domain of the last city of Lothar, where she had spent her childhood, lay along the cliffs far to the west of there.

Our boldest plan of action would have been to hurl the machine, by means of the rocket tubes, into the abyss in a direct attack on the Lord of Flame; but Sam, for reasons he did not divulge, doubted the success of such a maneuver. He wished to keep up his researches, and possibly to visit the city of Lothar. His apparatus told him that hidden forces were again stirring in the ether.

For ten hours we moved toward the north, making a long detour to westward to keep within a valley, and always trying to take advantage of such cover as was offered by the purple trees. The country was, for the most part, rolling and green, with the great flowering trees dotting the hills and plains but sparsely. The blazing radiation of the eternal crimson day was undiminished, but the temperature fell slightly with increased altitude.

Xenora and I were together at the cabin control-board, driving the machine; and Sam was in the conning-tower, with the little gun, ready for emergencies. When we had been moving for some ten hours, we mounted a low, bare hill, and saw in the little green valley before us a thicker forest of the bright purple trees, offering good cover for the machine.

We had crossed the summit, and I had increased the speed to ten miles per hour in haste to reach the trees, in spite of Sam's fear that the operation of the motors at anything like full capacity would create a disturbance in the ether that our hidden enemies would pick up.

Suddenly I saw a strange thing skimming along over the bright forest before us—in our direction! It looked like a bright silver globe, many feet in diameter! It floated a few hundred feet above the trees, drifting smoothly along like a bright metal balloon in a very swift wind. There was no visible propulsive mechanism.

I shouted a warning to Sam through the speaking tube, to stand by his little gun.

Xenora laid a light hand on my shoulder and said, in a tense voice: "It is the Sleepers of Mutron, the slaves of the Lord of Flame! They will fight to death—they know not fear!"

As the silver sphere drifted swiftly and silently down upon us, as though borne by an invisible wind, twice I caught a glimpse of a slender ray of purple flame, that darted out of it and moved searchingly over the bare greensward below. And then a rich purple beam fell suddenly and intensely upon the Omnimobile!

When that misty finger of purple light discovered us, I saw a strange vortex of pale green fire spring up about the globe and reach out in our direction. Suddenly I realized that this ship was of the same appearance as the weird thing that had destroyed our cottage! Small hope, I thought, if that force of atomic disintegration were to be released again!

I heard the rapid crashing of the machine gun, as Sam began to fire, and presently bursts of smoke appeared about the gleaming sphere. But to hit a relatively small and rapidly moving target even a mile away is no mean feat of marksmanship. I drove rapidly for the purple wood, but with little hope of getting there before the terrible red disintegration had melted us away.

Suddenly I heard the drone of some of Sam's new machinery going into action. He had mounted his switches and dials in the conning-tower, so he could control it from where he stood. Vivid blue electric flame quivered and flashed over the metal parts of the machine as his new weapons went into play!

The floating globe of silver drifted nearer, and the misty vortex of green fire about us grew more intense. A strange red glow stole over the vegetation around us, and a solitary purple tree ahead burst into crimson flame. Then the sparkling fingers of purple fire reached out at us again from the sphere. I wondered vaguely why the strange force was not acting upon us. I did not know, until it was all over, that Sam's vacuum tubes had set up a repulsive screen in the ether, protecting us from the electronic vortex!

Abruptly an intensely bright, blinding tongue of white flame leapt toward the silver thing from the great platinum electrode on the nose of the Omnimobile! Sam had turned loose his electric arc! The flame struck the globe, impinging upon it like a jet of fire, converting it into a ball of supernal light!

Then it fell! It plunged toward the forest in a gleaming curve! The green vortex of the disintegrator ray was gone, and the purple fingers shone no longer! The incandescent shell crashed out of sight beyond the purple trees!

CHAPTER XXIII

The Green Slaves

SAM snapped off the arc as the silver ship fell, and the drumming of the generators stopped. For a little time the world was very still. Xenora stood tense and silent beside me. As I turned toward her, I caught the slight perfume of her dark hair.

Indeed, the Green Girl was a beautiful being! The white flannels she wore failed to conceal the delectable curves of her slight and boyish figure. Her rich, red lips were parted slightly, in the unconscious intensity of her outward gaze.

Abruptly she became conscious of my look, and turned to face me, with a quick smile on her face. There was a radiant, joyous light in her eyes. The soft green tint of her skin was obscured by the rich, warm flush of her excitement, and she smiled with gladness.

Impulsively she reached her slender hand out to take mine. "You have won, Melvin Dane!" her soft voice said. "The ship of Mutron is fallen! We shall not be slaves of the Lord of Flame! We shall not die the violet death in the pit of Xath!"

"I hope not, my Xenora," I said. "I hope——" and I stopped in a little confusion. I was not really embarrassed, but I could not go on. Really, talking to a princess like Xenora is quite a different thing from making protestations of love to a being of one's dreams.

"What is it that you hope?" she said quickly, with an impish smile.

Sam saved me by coming in from the turret, begrimed with the smoke of the little cannon. He was a wonderful man. He was still strong, erect, and confident, despite the load of toil and hardship our adventure was putting upon his seventy years. His white hair was tousled, and he was cheerfully loading up his ancient pipe, as calmly as if he were in his own kitchen in Florida.

"Looks like the arc did for 'em all right," he said briskly. "Suppose we get over and take a look. We might pick up something new."

"Very well," I assented, and turned to start the motors. I could not resist a grin at Xenora, who was still regarding me with a speculative smile. She laughed back at me; then was suddenly serious.

"Be careful! The Sleepers of Mutron! They might be alive in the wreck! As long as they breathe, the Lord of Flame rules them!"

I started the generators, and the Omnimobile rolled heavily down across the green slope, and through the fringe of flaming purple trees. In a few minutes we came upon the wreck of the silver car, a great tangle of twisted wreckage, half fused by the electricity, and bent and torn by the fall. It lay in the little open space, with a great tree splintered and smoking under it, and the ground about empurpled with fallen petals. The twisted metal plates gleamed brightly in the light of the scarlet sky.

I stopped the Omnimobile, and we got out and approached the wrecked machine. There was a vast mass of the débris. The globe must have been forty feet in diameter. We spent several minutes in gazing at it from different angles, and then Sam and I climbed into the tangle of bent white plates and massive twisted girders.

The machinery had been too completely destroyed for us to be sure just how it worked. But Sam thought that the shell had carried tanks of water, the gravity of which had been negatived by the emanations from tanks of the same luminous gas which supported the roof of waters, lifting the ship. From the nature of the fragments of electrical machinery we observed, it seemed that the horizontal propulsion was attained by the ionization and repulsion of the helium atoms in the air. The apparatus that had produced the atomic disintegration was too badly wrecked to be identified.

Presently I came upon the body of a man, caught between two twisted bars, and cut half in two. The body was naked. It had a greenish cast that was darker by far than that of Xenora's fair skin. The physique,

and the size and shape of the head, showed a race of high intellectual development.

The dead man had a metal frame clamped upon his back. It was twisted and broken, and whatever had been fastened upon his body had been torn away in the crash. And the corpse had upon its back the strange violet stains that had been upon Xenora when we found her!

Presently Sam found another body. It had been half burned up by the arc. It, too, had the metal frame upon it, and the thing the frame was to hold was still clamped to it! The body bore, fastened to the back with those cruel metal clamps, a six-sided bar of blue metal! It was six inches in diameter and two feet long!

"This must be the thing Xenora calls a 'fire crystal,'" Sam said, "though I don't see any fire about it. It's damned queer!"

"Do you suppose there is machinery in the bar, that generates forces or currents that move the man about like a puppet?"

"Might be. I don't know. The metal thing may be a receiver for the occult force set up in the ether by the Lord of Flame—hypnotism by radio, perhaps, or something of the kind."

"Anyhow, as you said, it's damned queer, like everything else we've found here—excepting Xenora."

"Suppose we take the thing along, and open it up when we have time?"

He produced a pair of pliers, and we twisted the odd blue bar out of its frame, and carried it to the machine. It was oddly light to be metal, though it must have been an irksome burden to the one on which it was fastened. We got aboard again, and moved for the cover of the purple wood, for we did not know how soon relief would come for the fallen ship. But Xenora assured us that the Lunaks, as she called the flying things, quite frequently destroyed the ships of Mutron, and that the fate of this one would be laid to them.

CHAPTER XXIV

The Blue Prism

FOR perhaps thirty miles we drove the great machine through the brilliant forest, southward down a broad valley. At last we stopped in a little grove of tall flowering trees, close by the cool crystal stream. Beyond the grove was a little patch of green clearing with the great purple trees closing in all about it. It was a peaceful spot, weirdly beautiful, and it seemed secure enough. The unceasing wind was not so hot beneath the great trees, and they shielded us from the burning, crimson glare of the sky.

The Omnimobile seemed safely hidden beneath the masses of purple bloom; and whenever we were tired, or thought ourselves in danger, we could retire to the quiet security of its cool interior, behind the thick metal walls. Frankly, I hoped that our stay there would be a long one. I tried to forget the menace that hung over the earth.

Our life there was simple, and, for my part, I was supremely happy. Or not quite supremely, for I could not quite still my conscience. I was pretty well resigned to fate, however. With such a girl as Xenora, a man might be supremely happy anywhere. We tramped together about the grove, gathered the tiny, bright-red flowers in the green meadows, and bathed in the cool dark pools, where the river flowed beneath the purple trees. Sometimes she sang to me the folk-songs of her people, monuments of the high estate that Lothar had once enjoyed.

What would it matter to me if the eternal death came again and forever to the upper earth? What would it matter if the earth did freeze? I forgot in the idyllic happiness of Xenora's companionship—or tried to forget. If the roof of water were changed to ice it would only be more secure! The maiden and I could live out our lives in this strange land, without regard to the fate of the world. One of her matchless smiles, or a note of her golden laughter, was worth more than all the earth!

Meanwhile, Sam was immersed in his laboratory work, in the examination of the prism of blue metal, and in his curious pet. The plant creature still grew with remarkable speed, and always showed most remarkable intelligence. It was always with Sam, flapping along above him on broad green wings, or walking awkwardly upon its thickening red tentacles. Sam gazed at the flickering colors of the membranes about the head, with the light of strange understanding in his eyes, making strange gestures with his hands. Just to what extent they could communicate, I never knew.

It always went with him, when he went to hunt for its meat. It was a voracious eater, requiring a kill a day. The great sloth-like animals were plentiful and sluggish; it was not difficult to stalk them. As soon as it was strong enough, the plant creature learned to carry Sam's rifle. Its extraordinary intelligence, or imitative instinct, is shown by the fact that one day it fired the gun itself, when it was flying with the weapon, and saw one of the sloths on the run.

It showed a very real affection for Sam. Once, when they were out together, it saved his life. One of the tuskers had suddenly charged him from behind, and the creature flew at it and attacked it madly with its undeveloped claws. At the cost of considerable minor injury to itself, it held the beast off until Sam could get in a shot. It always showed an odd delight at his caresses, and seemed to take a peculiar joy in the music of his old phonograph.

As I have said, it grew very quickly. At the time we stopped in the wood, it was somewhat smaller than a hawk. Perhaps two months later (time was rather meaningless to us during that one happy period of our adventures in that world of unending day) the creature had grown so large that once, in an apparently playful mood, it was able to lift Sam and fly with him on a circuit of a hundred yards, bringing him back to the machine and setting him down very softly. Then its armored brown body was as large as a man, and the green wings were like sails.

That was near the end.

During all that period, Sam devoted much time to the examination of that bar of strangely light, bright blue metal. He felt that in it he might find a solution to the mystery of the Lord of Flame. I assisted him as much as I could. The metal was evidently an alloy. Analysis showed that it consisted largely of aluminum. There was a trace of a heavy metal that we could not identify. And the bar was slightly, very slightly, radioactive—perhaps, Sam thought, merely because it had been exposed to intense radium emanations.

The density of the bar was only half that of aluminum. For some time we could not understand that. Careful examination showed no break in the surface; and presently we sawed it in two, and then in many pieces, searching for the machinery that we half-expected to find. But, as far as we could determine, the bar was absolutely homogeneous.

Then Sam thought of examining it under the microscope. He found that it was full of microscopic bubbles—hollow places! By later experiment, we found that the metal was just a sponge of the strange alloy, filled with tiny bubbles of helium gas, under considerable pressure. Sam presently formulated the theory that the alloy, when formed, had contained considerable amounts of radium compounds; and that the alpha particles, or charged helium atoms, thrown off by the disintegration of the radium, while the metal was in a semi-plastic state, had been imprisoned in it.

But it was not until later—much later—that we got the true meaning of it—that we understood the insidious force that acted in the metal, to make human beings slaves to it!

So the days went by—happy, carefree days for me. I knew real joy for the first time in my life. Since youth I had known the Green Girl in my fancy. I had longed to find her, with a restless, hopeless longing that had left me discontented and unhappy, whatever my surroundings. Now, at last, she was really mine. I loved her with a singleness and intensity of affection that turned all my emotion in one direction, so I felt little fear or care for anything else.

One day, when we sat like children together on a cool, moss-covered rock beneath a great fragrant purple tree, with a crystal pool before us, gleaming like molten ruby in the light of the scarlet sky, I told her quite simply that I loved her—that I had known her always, and loved her as long.

"The white chieftain of my dreams," she whispered, "for what long years I have wished for you to come and tell me that!"

There was no need for further words between us. It was a long, long time before we returned to the machine, and then I am afraid we both flushed a little before the smile of tender understanding on Sam's lean face.

CHAPTER XXV

The Tragedy in the Purple Wood

OUR woodland life was happy. We were quite unconscious of the events that were shaping themselves to bring sudden catastrophe. We saw in our simple lives no foreshadowing of the supreme moments of the stupendous drama in which we were involved. The crisis came with little enough warning.

On the last day of our joyous existence there (we had fallen into the habit of making an arbitrary division of our time into days and nights), Sam arose and fixed our breakfast. I remember that we had pancakes, with maple sirup. Then, since "Alexander" was fluttering about, eager for the day's hunt, and flickering messages to him with its petal-like membrane, he got his rifle and they departed.

As the old scientist walked off through the purple trees, puffing steadily on the old pipe in his mouth, fondly watching the huge, winged beast that flew along above him with his gun, little did I dream of the tragedy that was in store! I could not have believed that Sam stood in any great danger. The winged creature that attended him was two-thirds grown; it would have been more than a match for a couple of lions! Certainly it was no feeble bodyguard!

An hour after he had gone, Xenora and I took one of my old romances of science, and walked a quarter of a mile up the limpid stream to a favorite resort of ours. We laughed and talked much by the way, and gathered a great bunch of the little red blooms. I was teaching her to read—at least that was our nominal business, though it was usually forgotten.

The living, wonderful mystery of her, her sheer perfection, the life and love that sparkled in her eyes, all enchanted me, carried my thoughts away from the page!

We sat together on our mossy stone seat, reading a little, and laughing and talking much, until we forgot all except each other. When I looked at my watch, I found that we had been there many hours. We got up and started back to the machine, speculating light-heartedly on what Sam would have ready for dinner.

We shouted carefree greetings as we approached the machine, and received no reply. We got to the deck, and descended to the cabin in vague alarm, but saw no sign of the old scientist. We hoped that he had only been delayed. I blew the siren several times, and listened to hear a signal from his gun. But when the echoes of the blast had died away from the silent purple wood, all was still again. We heard no answering shot.

I climbed out on the deck to listen. Not a sound disturbed the stillness, save the faint rustle of the unceasing wind in the purple trees above, and the crystal tinkle of the little stream. Green meadows and bright trees lay steaming beneath the hot red sky—quiet as death. The stillness was ominous. It bore the portent of doom!

Presently Xenora crept up by me and ran her strong cool arm through mine. Her violet eyes were solemn, now; and her fair face was clouded with anxiety. She had come to share my love for Sam.

"I am afraid for him," she whispered. "Many things might have happened. The beasts he hunted may have charged and killed him. Or a ship of Mutron may have found him—the ships of the Lord of Flame travel even to the waters of the lower sea to do battle with the Lunaks. And there is another danger of the wood—that is never seen. The hunters of Lothar never venture far from the city."

Her words were not particularly encouraging, and I made ready to go to look for Sam at once. I carried a heavy rifle, my pistol, and an emergency medicine kit. Xenora insisted on going along, and I could do nothing but assent. I did not wish to leave her alone, and she herself was no mean woodsman. In fact, when it came to the matter of following the trail over the low green plants, she proved far more expert than myself.

We left at once. The trail led us east for a mile, parallel to the stream, in the cover of the purple trees. Then it turned north across an open meadow; and there Xenora picked up the spoor of one of the great sloths, which Sam had stalked. It led on to a group of three giant purple trees, and there we found two fired catridges from Sam's rifle. Three hundred yards farther on, in an open meadow, we found the kill.

Alexander had evidently had his fill from it; and near by were the dying embers of a fire, and the charred green

stick on which Sam had cooked a steak for himself. The ground around the fire was somewhat torn up. The green plants had been uprooted and crushed. And there on the ground I found another cartridge from the rifle.

Presently Xenora picked up a trail leading toward a clump of the flowering trees to the north. We followed it hastily, silent with fearful anticipations. Twice we saw on the ground great splashes of green liquid, of the life-fluid of the plant creatures. Had Sam's pet been fighting for him in the air as he fled?

Then we came to the pitiful end of the trail. The ground was frightfully torn up, as if great bodies had struggled there. There were great splotches of the green fluid, and a fateful stain—evidently of human blood. Sam's battered pith helmet we found on the ground there, and six fired shells—silent tokens of the battle!

From the spot no trail led away. There was no evidence to show whether the battle had ended in death or in capture, nor anything to show what manner of being the unknown assailant had been. For a long time we stood there, gazing at the spot in lifeless grief and despair, apathetically fingering the helmet and shells, vainly trying to picture the contest, and looking about for other signs.

"It is no use to go farther," Xenora said at last. "It is the unknown menace of the purple wood. Many a man of Lothar has been taken by it—it is a silent, winged death!"

CHAPTER XXVI

The Last City of Lothar

PRESENTLY we turned and trudged wearily back to the Omnimobile. There was nothing else to do. I was sick with an aching heart. It was incredible that Sam, kind and true friend that he had always been, should be no more. A choking lump rose in my throat, and I confess that a few tears rolled down my cheek.

But I still had Xenora. As we walked, I put my arms around her, protectingly, in the grim determination that this strange world should not rob me also of the dream girl for whom I had searched two worlds. My love of her kept me from utter despair, but even then I knew that our ideal life could not go on.

I would have to find what it was that had taken Sam—to identify the thing that Xenora called so vaguely "the menace of the purple wood." Might it be the wild plant monsters, or was it something even more alien and terrible? And I thought more seriously of the danger to the earth, that I had been trying so vainly to forget. Sam's responsibility had fallen on my shoulders. I must see what I could do.

With the wonderful intuitive knowledge of one another's thoughts that Xenora and I have always had, she understood what was passing in my mind before I said anything. Softly, she took my fingers in her hand, and looked at me with deep sympathy in her eyes.

"I know, Melvin, what you think. And it is right. It is hard, so soon after you have come here to find me—but it must be. I can guide you to the city of my people. I can even show you to the brink of the pit of Xath, if you would go there!"

"You are very brave and true, my princess!"

"I come from Lothar! If you feel that your duty bids you risk the violet death in Xath, I would not dissuade you. But the Lord of Flame is mighty—no man can fight him! He has power over all!"

"Except our love," I said. I stopped, and took her in my arms, and pressed her red warm lips against my own. In the whole world, she was all that was mine. She clung to me fiercely, as if the terrible power of the pit of flames was trying to tear her away.

At last we went on, and presently we reached the Omnimobile, hidden in the purple grove. In Sam's absence, it looked very cheerless and lonely. We got aboard and made ready for departure. I tuned up the motors, and examined the electric weapons, and cleaned and loaded the little cannon again. As I worked, Xenora went in the galley and fixed a lunch. We ate quickly, under the silent pall of bitter tragedy, thinking of the smiling old man that should have been with us.

Then we climbed into the conning-tower, and I switched on the engines. The humming of the generators rose again, and the great machine lumbered clumsily out of the little wood, where it had been hidden for so many happy days. For many hours we held a northwestward course over the green plateaus and through the purple woodlands, with the light of the crimson day shining through the ports.

Xenora stood by me and chose the route. For the last few miles we crept along just east of a high, bare ridge of rocks. At last she bade me stop the machine in a clump of trees at the foot of the hill. The last city of Lothar, she said, lay but a mile beyond.

I took my binoculars and a rifle, and we left the machine and clambered up a half mile to the top of the ridge. The girl led the way, slipping cautiously through the rocks. At last she threw herself down behind a fringe of the low green plants, and motioned me to crawl up beside her.

"Look," she whispered, "and see all that is left of Lothar, the proud kingdom of my fathers, under the curse of the Lord of Flame!"

Indeed it was a scene of ruined grandeur that met my eyes. A little valley, perhaps two miles wide, lay beyond the ridge on which we were concealed. On the low hill beyond, standing out against the crimson sky, was a massive ruined wall. Back of it rose the crumbling desolate ruins of great towers and palaces of stone, covered with the moss of centuries of decay—merely the bare bleached skull of a dead civilization!

"It was in those fallen palaces of my fathers," Xenora whispered again, "that I found the strange machine that brought me the first dream of you."

I put up the glasses and made out the actual city outside the wall. Certainly Lothar had fallen since its days of radio. There was a mere straggling village of rude stone huts spread out on the valley floor, below the colossal ruined metropolis. The few hundred buildings were surrounded by a little cleared space, with the purple forest creeping up to reclaim it forever. I made out a few children playing about the trees, and a dozen ill-clad men working in the clearings. A few wreaths of smoke curled up from the dwellings; the peole had not yet lost the art of fire!

And hanging silent and menacing in the air above the village was the visible symbol of the alien power that had wrecked that ancient civilization! A great, gleaming silver ball—a ship like the one we had fought—hung motionless above the huts, with a quick purple beam from it flickering frequently over them!

For a long time we lay there watching that desolate, pitiful scene, and then Xenora touched my arms, and we slipped back down the ridge. She was silent, with grief and despair in her eyes.

"See!" she whispered at last. "See! Lothar is dead! The Lord of Flame has killed it! The men are poor struggling wretches; they could do nothing even if the flame were gone! My father was the last king of Lothar. His was a troubled reign, and he has been dead many hundred sleeps!"

"Don't grieve so, my princess," I said. "There are still vast cities above the waters, where men are powerful and wise, and where the sky is blue and a white sun shines, and where there is a domain many times larger than all this abyss!"

"Can we go there—ever?" she questioned eagerly.

"No. We can never leave this land, even if the Lord of Flame is killed. The machine cannot break through the roof of water from below. And the power of the Lord of Flame is coming to earth. Even now it may be a dead and frozen world."

And drooping in the silence of dull despair, we reached the machine, and drove quickly for the protection of the deeper wood.

CHAPTER XXVII

Mutron of the Sleepers

FOR half a dozen hours we lumbered eastward through the forest. We wallowed through swamps, and rolled over broad green meadows alight with the crimson day, and broke through jungles bright with purple bloom. At last we emerged on a narrow upland, with the great lake below it. The black sheet of water, tinged with the red light of the sky, stretched away for many miles to the eastward. Along its northern shore we could see the low cliffs that divided it from the pit of Xath.

We stopped the machine, and looked for a long time across the black lake to the north, and over the low cliffs to the ruby mist beyond, alive with the dancing violet lights.

Then I turned to the rare girl beside me, who was watching me with tears brimming in her violet eyes. The utter grief, the black despair on her face half broke my resolution. I felt doubtful, weak, utterly miserable, with pain stabbing at my heart like a thin steel blade.

"It is right. You must go," she whispered bravely.

I took her in my arms again. How wonderful and true she was! Struggling so bravely to hold back her tears! More precious than ever in the final parting! A single hour of the heaven of that embrace—embittered by the knowledge that it would soon be ended!

Then, quickly, lest my resolution fail, I made ready for departure! I stretched up a tent in a little grove above the lake, and stocked it with a liberal assortment of supplies from our store-room. I gave Xenora an automatic and a case of ammunition, and showed her how to use the weapon. Here she was to stay, in the vain hope that I might return a victor from the mad attack on the Lord of Flame.

For I had determined to enter the abyss. I knew that was what Sam would have me do, rather than lose time in an attempt to learn his fate. Xenora was eager to cast her lot with mine, but I would not hear of it.

A choking lump was in my throat as I staggered aboard the Omnimobile, and closed the manhole with a trembling hand. I gave a final heartbreaking glance to the splendid girl, majestic and erect, even in her pain, standing desolate and alone by the tent. Then I turned on the generators, and drove north along the lake shore.

I had the rude map that Sam had drawn from Xenora's knowledge. It showed the pit of the Lord of Flame to be just north of the lake, separated from it only by a surprisingly narrow wall of cliffs which, the girl said, had been a highway of her fathers, though it was now covered with jungle. And the city of Mutron was shown north of me, on the brink of the pit of Xath.

Steadily I drove northward, in a daze of fevered pain. It seems an eternity when I look back upon it, but it could not have been many hours. Automatically I kept in the shelter of the purple trees. At last I emerged on the edge of a great plateau, covered with the green vegetation, many miles across. On the south and west, from whence I had come, it was surrounded by purple trees—by the thick purple wood in which I had halted. On the north the great cliffs towered up to the sharp-edged scarlet roof, four miles above. It was strange to see the blue walls cut off so abruptly by the red. The sky was like a red lake seen inverted in a mirror. Those blue cliffs were hardly a dozen miles away now—I had to bend back my head to see the sharp line where the roof cut them off.

On the east side of that plateau, there was—nothing!

Beyond, lay the pit of Xath, with the faint ruby mist above it, filled as always with the wavering reflections of violet flames. And a half dozen miles before me, on the brink of that pit, stood—Mutron!

The City of the Sleepers!

A strange scene it was! A city of silver metal! Domes and towers and pyramids of argent whiteness! Vast incredible machines! Huge and oddly wrought structures! Titanic cubes and cylinders and cones! All of gleaming silver! The city shone with a cold light. It was as weird, as unearthly, as a dead city of the moon! It had the silent, ghostly gleam of moonlight! It was wrapped in mystery, clad in frozen fear!

And the city was not idle. Those vast amazing machines were moving. Silver globe-ships were drifting in silent haste above it! And ever and anon, one of them dropped over the rim, into the pit of Xath, or one floated unexpectedly up out of that abyss!

As I stood there in the Omnimobile, in the shadow of the last of the purple trees, my heart grew sick again with doubt. What, indeed, could I, with my puny machine, do against the great science that that city of mystery represented? The men of one once mighty empire were now slaves to it! What hope was there for me? Was not the human race, like the bison or the dodo, about to fall before a superior power?

But there would be no turning back. I saw to it that all the machinery was in order, and returned to the conning-tower. Before me was the instrument board that controlled the electric arc and the rocket tubes, as well as the machinery.

I started the hydrodyne generators at their full capacity, and then threw the switch. As the half million horse power went through the resistance coils, jets of superheated steam roared out of the nozzles, condensing in white rushing clouds. The terrific force of the jets uprooted the purple trees, and the machine vibrated to the mighty blast. I was hurled into the air. With a speed

that swiftly increased to many hundreds of miles per hour, I hurtled the broad plain, and over the ghostly white city of silver—and into the abyss!

The plateau ended abruptly as if cut off with a knife. The crater fell sheer away before me, stretching to the vast blue cliffs in the north, and to the line of living purple and green that marked the beginning of the eastward forests. Only a thin green line separated the abyss from the lake on the south, which, in the reflected light of the scarlet sky, horribly suggested a sea of blood, ready to flow into the pit.

Undoubtedly the crater was of volcanic origin. I could not determine its depth, nor the state of its floor—it was filled with the thick crimson mist. The wavering tongues of violet fire still flickered through it, throbbing strangely, like the reflection of fires below—hinting unpleasantly of alien life.

As the rich green plain vanished beneath me, and I sped high over that busy strange white city and into the haze of the abyss, an odd feeling of the wildness and the unfamiliar terror of the place stole over me again. I was very thankful for the invention of Sam's, for the thin helmet of wire gauze above my head!

Suddenly a great twisting bar of green fire writhed up, like a serpent's head, from the nest of flames. It swung and coiled and twisted through the rosy mists with a slow, deliberate motion, like an incredible reptile of flame, raising its head, *looking, searching!* Despite the helmet, great fear swept my brain like a hot flame!

CHAPTER XXVIII

The Flaming Brain

MIGHTY winds whipped about me. The roaring jets of steam drove the throbbing machine on over the rosy mists, and over the flickering violet flames. And I fell—dropped into the hidden pit. Vividly I saw the great writhing head of green rising above the fire-fog ahead, with that in its waving, serpentine motion that told me that its eyes were already upon me! I was certain that it was a living, sentient entity, that it was intelligent!

Could my weapons avail against it?

I fell through the rosy clouds. The green and purple rim of the abyss grew vague, and the blue cliffs in the north assumed a misty indistinctness. The red mist shone until it seemed that I was swimming in a fog of crimson fire.

And all the while the bright beautiful face of Xenora was before me. The light of her clear violet eyes drove the strangeness and the fear from my mind, leaving only my pain at leaving her. I drove the machine mechanically, lost in a daze of grief.

For ages, it seemed, I shot forward through the haze. At last I made out a bare floor of sand and rocks, pitted with circular craters. It was a good thousand feet below, and still dim in the haze. I opened the bow tubes, and the force of my fall was checked. In three minutes more, the machine struck the earth, bow first. It tore a vast hole in the sand, and rolled over twice, coming to rest on its side. Fortunately it had been built to withstand such knocks; fortunately, too, I was strapped in my cushioned seat.

I got the motors started and worked the machine to an upright position. The crater floor was visible for half a mile about in all directions. It was a dead, desolate waste of hard sand and twisted black volcanic rocks. Further vision was cut off by the rosy mist that hung above the floor.

Then I saw, far before me, a bright violet gleam through the crimson mist! Indistinctly I saw a broad green shaft of pulsing fire rise from it, to lose itself in the crimson sky! That intense violet light, from which the flickering reflections came, and from which the green beam reached up, I knew, must be the seat of the Lord of Flame!

I started the engines once more, and the machine rolled mightily forward over the bare rocks, with a great clangor of metal upon stone, forging ahead at last to meet the alien menace. It roared over bare sandy flats, rounded great boulders, crashed into pits, crawled through craters! Then, suddenly, that terrible green flame flared out toward me! I knew that I had been discovered! Like a lance of green flame it flashed through the red gloom above! Its motion was alert, surprised, terrible!

I set the loading mechanism of the little gun to fire high explosive, and put it in action, hurling shells in the direction of that violet light. And still I drove swiftly on. The flashes of the explosions were visible through the mist ahead, but the deep violet light still glowed.

I turned on the reserve power units, and the machine vibrated from their throbbing drone. I threw another switch, and the deep purr of the giant transformers filled the ship. The mighty white tongue of the electric arc reached out ahead of me!

And the Omnimobile plunged on!

Two of the silver spheres—the ships of Mutron—appeared before me, with the green vortexes of the atomic disintegration springing up about them. The great arc brought them down in incandescent wreckage almost as soon as they came in view!

The violet mist grew brighter, more distinct. I knew the shells were bursting near it, and that the arc would reach it soon. The faithful old machine lumbered rapidly on over the wild and twisted rocky desert—a waste as terrible as the mountains of the moon!

In fact, that crater-pitted floor bore a curious resemblance to the typical lunar landscape, and the forces that produced them must have been similar.

Then the mist cleared, and I saw the form of the thing that gave the violet light! It was scores of feet thick, and hundreds tall! It was a vast smooth cylinder of violet fire! It shone like metal, which was white hot and seen through violet glass! The color of it ran and flickered on the surface! Violet sheets and bands crawled and flashed upon it, and violet flame flowed away from it in many little tongues. The thing was perfectly smooth and cylindrical, five hundred feet in height—a Titanic "monolith" of metal!

Still the Omnimobile lumbered irresistibly onward. The little gun crashed regularly, and the shells threw up the earth about that weird cylinder half a mile ahead. And the great white flame of the arc was playing far out toward it like the sword of the angel of death!

I saw a cluster of curious gleaming machines about the base of the great cylinder. One of my shells must have struck them, for they suddenly seemed to collapse and dissolve in a cloud of white smoke.

Abruptly a huge, terrible bar of green fire rose from the top of the cylinder almost like an extension of it—

it was like a beam of green light from a vast searchlight. But it bent and twisted, as if it were alive! It moved like a snake, writhed toward me!

And then came the catastrophe!

A great pit in the rocky desert suddenly appeared before me—a hundred-foot chasm! I made a wild attempt to swing the machine around it. But, busy with the arc, the generators, and the gun, I had seen it too late. The brink loomed before me! Desperately I set the brakes. The machine paused jerkily, hesitated, then leaped over the rim! For a breathless second it fell down the sheer crater wall! I had no time to use the rockets! It crashed heavily upon the rocks!

I was torn from my seat and flung cruelly against the side of the conning tower! My helmet was knocked off! And on the instant, a red storm of fear broke about me! It beat down on my brain like a rain of horror! It throbbed with an archaic rhythm, stirring strange emotions that overruled my reason and volition! Terror swept about me like a fierce wind from a hot desert of death, picking up my soul and sweeping it away to a fate unnamable!

I struggled with it terribly, with all my will. But it beat down my feeble barriers like a resistless tide. It burned away my will like a hot flame in my brain!

That horror came over me in a vast, overwhelming wave! It seized my body! My hand moved unwillingly, and cut off the current of the great arc! And then my body was struggling to its feet, opening the manhole, and clambering out of the machine. But still the thing did not have *me!* I was still an independent entity, that sat apart and watched.

I knew that I had succumbed to the hypnotic control of the alien power that dwelt in that vast metal cylinder. I was another of the slaves of the Lord of Flame—of the Sleepers of Mutron!

CHAPTER XXIX

Xenora's Sacrifice

I WAS moved out of the machine like an automaton by the terrible force that controlled me. My body was no longer my own! It was swept along as if by a mighty wind. That force of horror roared and throbbed in my brain. Red flames of fear flickered before my eyes. I was sick and faint with terror. But my body did not collapse—it was relentlessly moved by that terrible force from the violet cylinder. I was utterly helpless—I felt the hopeless horror of one chained before a loathsome monster!

Suddenly I wished fiercely for death, for only death could bring me freedom from the horror that swept in a throbbing torrent through my brain. But even death was beyond my reach, for my hands were not my own!

For a moment that power left me standing on the side of the overturned machine. The Omnimobile lay on the sandy floor of the crater, which may have been a hundred feet in depth and as many yards across. Against the red sky, above the black cliffs of the pit's farther rim, towered the violet metal cylinder—the flaming metal brain whose hypnotic control ruled my body.

For a moment I was left standing there, and then my body was springing down and running across the rock-strewn sand toward the cliffs. It ran like a machine—beyond my control! In vain I tried even to stumble and fall! In a few moments it reached the rim. It clambered wildly up. I know that in my normal self I could never have surmounted that sheer wall. But the telepathic force from the flaming brain seemed to give my limbs superhuman strength! Soon I was at the top, with bleeding hands and tattered clothing!

And my body ran on toward the violet monostyle!

It was two hundred yards away—a Titanic smooth upright cylinder of metal, the polished surface crawling and flowing with violet flame, with the great incredible serpent-like beam of green rising from the top.

It was astounding—in the strangeness of its aspect, and in its inexplicable suggestion of alien intelligence! But how could there be intelligence in metal?

And then I saw the men about it!

Two of the vast silver spheres were stopped on the ground below the cylinder, oddly dwarfed by its vast height. And about them were men! They were the green slaves—the Sleepers of Mutron! Their bodies were naked but for tattered scraps of cloth. Fastened upon their backs by the cruel metal clamps, they bore the strange prisms!

But those bars of metal were not blue like the one we had taken from the dead man! They shone with the same mysterious violet radiance as the Titanic monostyle. They were parts of it—akin to it!

The men moved like sleepers, or like machines, as I felt that I was moving—as if their wills were dead! They toiled in tireless haste, without confusion. Many were carrying burdens. And it seemed that some were polishing the surface of the cylinder, or applying some luminous substance to it. Near the ground they were quite plainly visible, clinging to its surface like flies, and toiling furiously. Higher up on the colossal cylinder they were but dancing black specks within the violet flame!

The ground about was pitted with shell holes from my bombardment, and at one side I saw the twisted wreck of the great machine I had struck. It is possible that I had hit the great cylinder itself, but it might have received the fire of the biggest gun in Christendom with little injury.

In two minutes more I had been drawn to within fifty yards of that vast shining column of metal. Then the force of fear that had seized my body permitted it to stop, and I stood still. That awful twisting beam of green flame reached out of the top of the thing, and bent down over me! It touched me!

I felt tiny whip-like fingers of it feeling—exploring my body! The green radiance grew denser about me. It enshrouded me in a fog of green light—so painfully intense, blinding and terrible, that I tried to shut my eyes against it. But that horror held them open!

And that green fire came into my body, and into my brain. It was eager, insistent, questioning—and so horrible that my being rocked with pain. It questioned; it commanded! It sought to know of me, and of my companions, of the Omnimobile, and of the world we had left above. I struggled against it, fiercely, terribly, until I felt my limbs chilling with the sweat of the conflict. But it won!

It took my mind as it had taken my body! It beat about my brain like a vast storm; it penetrated my being in a flood of green fire! My brain reeled, was swept by an avalanche of awful power! I sank at last into merciful oblivion that was the counterpart of the death I had so desired!

At last, when I was vaguely conscious again, I had a curious feeling of mental exhaustion. I felt as if I had undergone a fearful ordeal. I felt as if I had toiled as I slept, as if I had answered many questions put to me by that power. It seemed as if the green light had swept the contents from my brain, had searched all my knowledge.

As I awoke, bodily sensation returned, and I felt someone lifting me gently from the bare earth upon which I lay: My limbs were cold and stiff; but the awful force that had controlled them was, for the moment, relaxed.

I opened my eyes, and cried out, first in incredulous joy, and then in utter despair. Xenora—the Green Girl—was lifting my head. There was anxiety and care in her violet eyes, and unutterable fatigue was shown in her body. She had followed me into the pit, to give her life with mine!

"Oh, Xenora, my dream girl, why did you come? There was no need for you to give your life!" I protested in bitter despair as she raised me in her arms and held me against her breath.

"I felt you battle with the Lord of Flame. I felt it conquer you. So I left the camp, to come."

"And how, in all wonders, did you get into this pit, and so soon?"

"My chieftain, it is not so soon! For three sleeps I have come through the forests and rocks, without stopping, while you lay still in the power of the Flame!"

"But why—why—come to throw away your life—"

"See, I bring you the wonderful thing of Barsoni Sam, that shuts out the horror. I give it to you, and you can go on with your battle against the Flame!—No, you can never conquer the Flame! But fly! Go back to your land!"

Even then I felt the horror awakening again, felt that fearful force directed again upon me. With a single quick motion, before I could prevent her, Xenora had whipped the electro-screen helmet from her head and drawn it about my own.

"Fly," she whispered fiercely. "The Sleepers of Mutron! And think not of me! Fly! Even from me!"

The horror relaxed, and I collapsed in a daze of relief. In a moment I had recovered and got to my feet. Xenora was a score of yards away, dashing off. I ran after her, calling for her to take back the precious helmet.

Suddenly she stopped. A convulsion ran through her frame. She turned, with her face a mask of livid horror. She was in the power of the Flame! She was a Sleeper! She bent, seized a rock, and hurled it at my head with superhuman strength. I dodged and it hurtled past my ear. She sprang at me like an animal, drawing the hunting knife I had left her.

I turned and ran wildly, as a score of the Sleepers came running. I passed close by that violet metal monostyle, and it seemed that its crawling violet fires reached out for me. I ran desperately toward the east! I heard the strange cries of the Sleepers of Mutron behind me! I felt the awful green flame writhing above me, but even it could not penetrate the helmet!

I was insane with terror!

I ran on and on, through eternities of heart-breaking effort. At last I stopped exhausted, with pounding temples and bursting lungs, to look behind me. The flaming brain was but a dull violet glow against the red sky. A desolate waste of bare rugged rocks and great round craters lay about me beneath the crimson mist. All was silent! The sounds of pursuit were gone!

CHAPTER XXX

"The Nitrate Plantation"

SHOULD I go on, or return and try to save Xenora, as she had rescued me? That question throbbed in my brain. The answer would have been easy enough if I had had her alone to consider. I might cheerfully have surrendered myself to that dreaded power to save her—any man would have done as much! But what of the menace to the earth? Should I give up the struggle?

For a long time I stood there on the rim of a strange crater, lost in indecision. At last my sense of duty to mankind was victor. I set off wearily toward the east again. The Omnimobile was so near the flaming brain that I dared not attempt to reach it, even if I had been confident of finding it. And upon consideration, I was sure that if the machine was left as it was, it would be only as a trap for me.

A sorry hope, indeed, was I for victory in the struggle with that vast alien power for the safety of earth! A man alone, ragged, without even a pocket-knife, lost in the wilderness of a strange world, and possessing only a modicum of scientific knowledge!

What folly, indeed, for one in such circumstances to pit himself against such a science! But that seemed the only hope for victory. With Sam in my place, the outlook would have been brighter. If I had a fair scientific education, Sam knew enough to raise cities and armies in the wilderness!

For many hours I struggled toward the east—away from the violet glow—over the desert of rocks and craters, through the ruby mist. And I came unexpectedly upon an explanation for the origin of the crimson haze. Thin clouds of red luminous gas were hissing from some of the craters or funaroles—escaping from the radium deposits in the core of the earth, to float up and augment the radioactive cloud that held up the waters!

I was half dead with weariness when I reached the mile-high cliffs at the crater's rim, and half insane with grief for Xenora, and with angry doubt of my wisdom in deserting her. I have little memory of how I got up that wall of rocks. I remember climbing until I was worn out, of toiling upward with bleeding hands and feet, of fighting on when I was dizzy for want of food and water, of struggling up when my body screamed in pain for me to surrender and drop to merciful oblivion in the abyss! I remember sleeping many times on ledges or in crevices when I could go no farther.

But at last I reached the rim!

I climbed out upon the flat plateau to the east of the abyss, a strange wilderness of green plains and purple trees, but infinitely welcome after the tortures through which I had been. I stumbled across the meadows until I found a little stream. Eagerly I wet my parched mouth, and presently I slaked my thirst, and ate a few of the date-like fruits of the flowering trees. And then I slept.

For a period of many months thereafter, I led a strange wild life—the life of a beast or a savage. It now seems to me that I must have been more than half

insane, yet I had cunning of a sort. Wandering about in the woodland in the first few days, before my strength was fully recovered, I came upon a great lump of native copper. With hammer and anvil of stone I set out to shape some tools of it. First I made a knife, and then a broad blade for a wooden spear. With those weapons I soon had stalked and killed one of the great fat sloths. After several weary efforts, I achieved a fire by friction, and feasted upon roasted meat.

Many were the mad and impossible schemes that my fevered brain formed for making an attack on the flaming brain of metal, only to reject each upon consideration. As I had hurtled through the air above the pit, in my ill-starred attack in the Omnimobile, I had been much impressed by the narrowness of the bridge of cliffs between the great lake and the abyss. Now it occurred to me that I might dig a canal, and let the waters of the lake in to flood the Lord of Flame.

With that in mind, I made an expedition to the isthmus, armed with copper pick and spade. I found that my eyes had curiously deceived me, from the air. The land bridge was a wall of rock, nowhere less than a hundred feet high and four hundred thick, covered with a rank growth of jungle. Along it, even as Xenora had said, was a ruined road. Here and there a crumbling stone monument rose from the jungle like a bleached skull of the dead civilization.

There was no hope of digging a canal. A hundred men, in ten years, might have been able to cut a tunnel through that wall of stone, with modern tools and explosives! Nitroglycerine! That started me on a new line of thought. I had once made chemistry a hobby. It was not impossible. For Sam, it would have been child's play. But, alas! there was no help from my old friend!

I set to work at once. For many months I labored. The task was a tremendous one. The first necessity was an adequate supply of nitrates. I was not fortunate enough to discover a natural deposit, as heroes of fiction usually are; so I set out to make a "nitrate plantation" such as is used for the manufacture of nitrates in a primitive way. I dug a great shallow pit, lined it with waterproof clay, and filled it with alternate layers of wood ashes obtained by burning the purple trees, and everything I could pick up in the way of nitrogenous animal and vegetable refuse. At last it was filled and wet down with water from my clay-bed. I had nothing to do but wait until the nitrogen products of decomposition had united themselves with the potassium bases in the wood ashes.

Then I fell to the mining of iron pyrites, and to the building of a furnace in which I could burn my pottery apparatus. After many disheartening failures I was able to set up apparatus that I thought would suffice for the manufacture of my acids. I burned rude jars, glazed with sand, in which to carry and store my reagents and explosives.

My memory of all that time is a dim dream of terror. Many times for long hours I stood on the brink, gazing into the flickering mist, thinking of Xenora and half determined to give it all up and to seek her. But always I went back to my mad task, toiling in a daze of grief and despair.

Before I did anything more in the way of manufacture, I paid another visit to the isthmus, and selected the site for the mine which was to tear an opening in it. I found a deep crevice in the rocks, and spent many weeks in clearing and enlarging it, until I had ready a chamber deep in the heart of the barrier, below the level of the lake.

During all that time I lived upon the little fruits and upon the flesh of the sloths I killed. I carefully saved the fat from the latter, saponified it with alkalies leached from wood ashes, and removed the soap by "salting down" with evaporated brine from a salt spring. I collected and stored the glycerine until I had many gallons.

At last, judging that my "nitrate plantation" had had time to serve its purpose, I dug it up, leached the product, and crystallized the saltpeter by evaporation in earthen pots. The yield was satisfactory in quantity and fair in quality, but it had cost fearful effort.

Then I set about the manufacture of sulphuric acid by roasting the iron pyrites with nitrate in my crude apparatus, collecting the acid in wet pottery condensers. That took many days, and the next step was making nitric acid by boiling saltpeter in sulphuric acid and condensing the fumes.

At last, when I had the three necessary chemicals—glycerine, and nitric and sulphuric acids—I set out to transport them separately to my mine, to avoid the hazard of the transportation of the finished product. That, again, was a heartbreaking task, for I had materials enough to make several hundred quarts of nitroglycerine, and the distance was half a dozen miles.

But ragged, ill-kept savage that I was, I had collected on the cliffs above my shaft the materials for the manufacture of a good quantity of high explosive. For one in my position, it had been a considerable achievement.

CHAPTER XXXI

The Mine on the Brink

AT LAST, in haste and fear and trembling, I began the task of mixing my chemicals, dumping them into vats of water cooled by evaporation, under a rude shed to cut off the fierce heat of the red sky. Even with all my precautions to prevent a premature explosion, the hazard was fearful. I washed the nitroglycerine, and carried it in earthen jars down into the heart of the cliffs. I meant to die in the final explosion, but I was afraid the stuff would go off before it was in place.

But finally I got the last of the rough jars into position. Then I closed the mouth of the chamber with rocks and rubbish, to be sure that the full force of the explosion would be exerted upon the cliff. I lit the fuse I had prepared—a tall candle of the sloth's fat, which, burning low, would ignite a powder train; and that would set off a charge of gunpowder I had placed by the jars of nitroglycerine.

I knew that, if my terrible months of toil had not been in vain, a few hours more would see a raging torrent of water rushing into the pit. At last I judged my task completed. I walked a few yards north to the rim. I stood on the brink of that sheer precipice, and gazed down into the rosy mist, alight, as always, with the wavering, reflected fires of the metal brain. I made no attempt to get beyond the range of the explosion. Hope was dead. Life meant no more to me. I was ready to be swept into the abyss on the crest of the wave that, if my plans went well, would drown the flaming brain.

For a long time I stood there waiting, lost in dreams

In a strange semblance to military order they flew, like fleets of battle-planes . . . Many of them, I saw, carried weapons . . . And then a flight of them swept downward again, and I saw Sam, mounted on one . . .

of Xenora. I had no doubt that she was dead. My regret was bitter; I stormed vainly and passionately at fate. If my reason had been tottering, now it was almost gone. I wept, and cursed, and then laughed loud and bitterly. A strange figure I must have been, wild and unkempt, red and burned from exposure, half naked, with insanity in my eyes, laughing and waiting to be blown to my doom!

And then I heard a sound that brought me into silent and cunning alertness! I sprang to the mouth of my shaft and crouched like a savage with my great copper-bladed spear at hand. I heard a stone

rattling and crashing down into the abyss! Someone—or something—was climbing up out of the pit! I crept forward where I could see, and lay tense and silent, a desperate madman, determined to protect my mine against whatever might find it.

At last a human figure clambered up over the brink, and drew itself erect in the edge of the jungle! It was a Sleeper of Mutron! The emaciated form was bent beneath the weight of the bar of gleaming violet metal clamped upon its back. It was clad in tattered, bloody rags. The flesh was bleeding from the fearful climb.

With the dull, mechanical motions of a sleeping person, or of a walking corpse, galvanized by some weird power, that terrible figure got deliberately to its feet. The bloody hands raised a long, glittering weapon of silver metal. And it plodded dully, lifelessly, toward me. And then a hoarse, wild cry echoed through the silent jungle—my own scream!

The Sleeper was Xenora!

With her old intuition of my thoughts, she had been able to penetrate my helmet! Through her, the Lord of Flame had read my thoughts of victory! She had been sent to prevent the mine's explosion, to snuff out that candle flame!

If she heard my scream, she paid no heed. She walked on toward me, with the same weary, mechanical gait. There was no light, no life in her eyes. They stared straight ahead, dully, unseeing! And the strange silver tube was held ready in her hand. She was more like a moving corpse—a dead avenger—than a living person!

A mad storm of desires arose in my brain. How I longed to spring up, to take that dear body in my arms, to minister to its hurts, to have the Green Girl for my own again! It took all my will to hold me in my hiding place. But this was not Xenora! It was a Sleeper of Mutron, a slave of the Lord of Flame!

It was a fearful choice before me! But my resolution held! I would carry on if it tore out my heart. With a burning pain in my breast, I ran my fingers over the jagged copper blade, and tensed my muscles for a spring!

Perhaps, after all, we would be better dead.

My madness was gone, but cold, grim determination remained. I knew that I would not hesitate. The silent, sleeping figure of the Green Girl was but a dozen yards from me, and I raised my ragged blade!

Then—a shadow upon the crimson sky! A whisper that grew to a mighty roar! The beat of many wings! A strange and ringing cry from the air above! A shouted, imperative, strange-toned command! Sam's well-remembered voice! A rushing sweep of vast green wings before my eyes! A tempest of wind as they beat the air! Xenora snatched up and out of my sight by great red tentacles!

I was petrified in incredulous amazement. It seemed impossible that Sam should be alive. Yet, there had been no definite proof of his death. And, I thought, it must have been Alexander that carried him, and that had swept up Xenora.

In a moment I had aroused myself, and dashed out of my hiding place beneath the purple trees. It was an amazing sight that met my eyes. There were numberless thousands of the flying plants on the wing above! The red sky was flecked with their green wings! In a strange semblance to military order they flew, like fleets of battle-planes. In scores and hundreds they dived and circled, in perfect formation. Many of them, I saw, carried weapons—vast clubs, or huge metal-tipped spears, or heavy stones and masses of metal.

And then a flight of them swept downward again, and I saw Sam, mounted on one that must have been Alexander—though the things all looked alike to me. He was evidently controlling the whole squadron with his shouts and gestures. The old scientist still seemed strong and able.

Then I saw Xenora. She was still in the clutch of the winged steed of Sam's. Even as I looked, the red tentacles tore off the flaming violet prism and hurled it into the abyss.

The weird, amazing creature dived. An incredible thing it was, with its armored brown body as large as a shark's, with the vast flower of the flowing colors about its head, with red tentacles like those of a gigantic scarlet octopus, and with wings like those of a green airplane!

It bore down upon me! A great crimson tentacle reached down and picked me up! I was swept through the air, held lightly in that strange grasp, and lifted until I was face to face with Sam, who sat astride the creature! He reached out his strong brown hand and grasped my own.

"Mel, old man, it's some luck to find you! And what do you think of my army? A couple of the flying dragons captured Alec and me, so I've been making the best of a bad situation. The things are really quite intelligent, and I've been drilling them for months. They're hereditary enemies of the alien civilization, anyhow. There's going to be some fight when we meet the silver ships!" Exultant, joyous triumph rang in his tones. He had not noticed my strange condition.

At last I was sufficiently recovered to speak. "I've got a ton of nitroglycerine in that rock," I stammered. "The lake will be running in the pit in an hour or so." My voice had a curious rusty sound.

"Nitroglycerine! You've been making it, and planting a mine! No wonder you look like a ghost! And how comes Xenora to have that damned metal bar on her?"

Abruptly I broke down into uncontrollable tears of relief and joy. I did not try to answer. In a few minutes the vast army of winged monsters had wheeled about, and was headed north again, over the crimson mists—line after regular line of beating green wings that bore the strangest army of history to the strangest battle ever fought!

But, at the moment, I was paying little attention, for I was mounted on another of those vast flying creatures; and in my arms was Xenora! She was limp, unconscious, sleeping the sleep of utter exhaustion. But she was free again from the Lord of Flame! With tears of joy streaming down my face, I tried to dress her bleeding hands and feet.

CHAPTER XXXII

When the Red Roof Fell

ABRUPTLY a green light ran through the rosy haze beneath us, and that dreadful twisting bar of radiance—that living, alien tongue of fire—the serpent-like head of the Lord of Flame, was thrust up out of the flickering violet! With its strange, writhing motion, it swept in a wide arc, as though it saw us! It searched the sky, and then drew back in alarm! The

terrible, rhythmic throb of the emerald gleam in it grew faster!

And quickly the crimson sky ahead of our flying army of green-winged monsters was filled with fleets of the silver spheres! They rose swiftly, by the hundred, in long, gleaming lines—floating, drifting, darting, as though carried in swift, cyclonic winds. And then in smoothly sailing squadrons they advanced to meet us, with the swirling green mists of the disintegration force reaching out before them!

The aerial battle-lines met! The winged monsters joined in mad conflict with the silver ships! It was a fierce struggle—a terrible scene! The plant-things swept to the attack, scores in number for each great ship. With desperate, incredible energy they wielded their gigantic clubs and spears; or, wheeling high above the silver vessels, dropped their missiles down upon them.

And the swift searching fingers of purple flame reached out of the silver ships, to guide the thick, swirling vortexes of atomic disintegration. Under that terrible force of flowing green, the plant creatures turned red, battled on for a moment as they glowed with an awful scarlet radiance, and fell in a rain of crimson sparks that fast faded into nothingness!

And ever the throbbing emerald column rising above the sea of ruby mist below us—the writhing serpentine bar of green that was the Lord of Flame—moved and twisted, directing its armies!

The plants battled with desperate ferocity, with incredible strength! In ones and twos and threes, the silver vessels fell, in twisted, battered wreckage—fell among the showers of sparks from the vanished creatures that had crushed them!

It was a battle of animal strength and courage, of desperate, savage energy—against deliberate, inhuman science! It was the battle of the mad, elemental beast—against silent, pitiless power!

And the plants won!

As the monsters that carried Sam and Xenora and myself swept along high above the line of battle, we saw the silver ships give way, saw them drop into the red mist, with the avenging, victorious plants following close upon them!

And then my mine went off!

A vast white cloud of smoke and shattered rock rose deliberately above the cliffs, spread into a Titanic mushroom shape, and fell in a great rain of débris into the abyss and into the lake. After many seconds the sound of it reached us—a crashing, deafening blast! The great wave of air swept up the green-winged fleet like leaves on a stormy lake!

Below the cloud of smoke, where the black cliffs had been, I saw a vast white sheet of waters—a rushing Niagara multiplied manifold—plunging over the brink in a sheer and gleaming arc!

Even as I gazed at it, in dazed wonder at the thing I had wrought, Sam was suddenly close beside me, shouting something with alarm and urgent command in his voice.

"Mel—the roof! Where is the Omnimobile? For God's sake——"

"In a crater in the abyss, by the metal cylinder," I cried, wondering.

Then I looked up, and saw that the flat roof was cupping up, like a vast inverted basin! The waters above were rising!

With no further word to me, Sam shouted a strange order to the monsters we rode. Their vast green wings were folded! We dropped like plummets into the crimson mist! The violet gleam appeared, and we made out the crater-pitted floor. I shouted directions, and in a few minutes we settled into the same little crater in which I had met disaster.

The Omnimobile was still lying there, just as I had left it!

The creatures that bore us dropped near the ground. Those great red tentacles set us gently down on the rocks by the machine. Sam led the way and I carried Xenora. Desperately we scrambled aboard and screwed down the manhole. Sam's mount, Alexander, slumped into a curious attitude of dejection.

Suddenly one of the silver vessels shot into view above the crater's rim, drifting swiftly towards us! The machine was watched! It had been left as a trap! The thing flashing beams of purple flame reached out eagerly—found the Omnimobile. The whirling spirals of thick green mist extended toward us!

Sam fumbled with the dials and made a hopeless gesture. Then I saw Alexander spring into the air and fly toward the terrible gleaming thing! With mad, desperate speed, the plant creature dashed straight into that fearful swirling mist! It charged on through it! Already glowing red with the disintegration beam, it struck the white machine with terrific force!

The argent globe paused, hung uncertainly, and then fell with swift acceleration until it crashed upon the walls of the pit, with the gleaming, wasting form of the heroic plant still clinging to it in the agony of a fearful doom!

For a long moment Sam was still. Suddenly he aroused himself as if from a daze of pain, and turned again to the instrument boards.

"The earth is not frozen!" he shouted. "The power in the ether is dead!" I thought of the havoc my cannon fire had wrought with the machines about the flaming brain.

In a moment he had the generators going, and the machine crawling to an upright position. Then he turned on the rocket tubes. The crater was filled with the roaring jets of steam, and we were hurled into the crimson sky!

I had a fleeting glimpse of the metal brain—the vast cylinder of violet—with the green beam still throbbing from it, and with the last of the silver ships battling the victorious army of plants that swarmed about it!

"The roof is lifting!" Sam cried. "The equilibrium was very delicate—the gas that kept issuing from the earth was lifting the waters to the danger point, and your explosion carried them past! The attempt to freeze the earth was probably undertaken because a roof of ice would have been more secure!"

His voice was drowned in a fresh rushing, whistling burst from the rocket tubes. I carried the inert form of Xenora down to the cabin, and did my best to care for her. In a few moments we were above the haze. I took a last glimpse of the green and purple forests dropping away below us, and turned again to the unconscious girl.

Soon the fierce red glare that poured in the ports told me that we had reached the red roof. And suddenly the Omnimobile was pitching and spinning madly, with wild waters thundering against her sides. A sound

reached my ears—a roar, dull, distant and slumberous at first, but rising to a crashing, deafening storm of sound! It seemed an eternity that I held the sleeping girl upon the tossing couch, while the very heavens rocked with thunder!

Abruptly, the bloody glare grew lighter, and was streaked with shafts of bright sunshine—white, precious sunlight of the upper earth! We had followed the vast bubble of gas through the roof of waters! The red mists cleared—drew up into the blue vault above—repelled into outer space!

We were flying in the cold white light, above a mad blue sea!

In fifteen minutes Sam had brought the machine down upon an ocean that was still heaving madly from the cataclysm that had drowned a world. He came into the cabin, and under his skilful ministrations Xenora was soon sleeping quietly, in a normal slumber from which she would wake herself again.

Presently Sam questioned me about my adventures. I gave him the whole account and concluded with the question that, for months, my troubled mind had striven so vainly to answer.

"Sam, how could intelligence exist in metal?"

"Why not in metal, Mel?" the old scientist replied, smiling thoughtfully. "Why not there as well as in lumps of impure carbon and water, as one of the early savants called us? But do you remember the radio-activity of the metal bar, and the little cells of helium gas in it? I think the radium had somehow set up neuronic circuits between the cells, like the circuits between the neurone cells in our brains. It is not impossible. That was a helium brain—but it was formed as naturally as yours or mine!"

On May 4, 2000 A. D., just a year after the beginning of my story, our leisurely homeward cruise was ended. The green coast of Florida rose out of the clear blue sea before us. Xenora and I stood on the deck, happy in the cool salty air and the bright sunlight. The girl was lost in vast delight at the new wonders of azure sea and sapphire sky. At last the dream of my life was come true!

The wonderful girl of my fancy was by my side, to be mine forever!

But she was the Green Girl no longer! A week of the sun and wind of the sea had erased the soft green tint of her clear skin, and replaced it with a light, smooth tan!

THE END

What Do You Know?

READERS of AMAZING STORIES have frequently commented upon the fact that there is more actual knowledge to be gained through reading its pages than from many a text-book. Moreover, most of the stories are written in a popular vein, making it possible for anyone to grasp important facts.

The questions which we give below are all answered on the pages as listed at the end of the questions. Please see if you can answer the questions without looking for the answer, and see how well you check up on your general knowledge of science.

1. How long would it take to go to the star Sirius, traveling with the speed of light? (See page 8.)
2. What factor of light would interfere with television and simultaneous radio reception from planet to planet? (See page 8.)
3. What are characteristics of interstellar space? (See page 9.)
4. What would be the apparent weight of a 210-lb. man under the effects of acceleration of 160,000 feet per second? (See page 13.)
5. Can you describe in detail the relations of a planet to the sun and planetary system? (See page 18.)
6. What is the correct term for an ant's nest? (See page 25.)
7. What is the life of the worker ant? Has the ant a distinctive brain? (See page 25.)
8. What is the nature and function of a nerve; and what is a "nerve message"? (See page 27.)
9. What do you know about the touraco? (See pages 31 and 39.)
10. In what part of the heavens is the constellation Andromeda to be found? What celebrated nebula is designated by its name and classification? (See page 45.)
11. How does this nebula compare with others of its type? (See page 45.)
12. What relation between heartbeat and music is claimed to exist? (See page 58.)
13. What rhythm in the orchestra is most noticed by the hearers? (See page 58.)
14. Can you name a popular theory about the action of the nervous system in the human organization? (See page 66.)
15. How would you go about making nitro-glycerine in a wilderness? (See page 76.)

Sequel to THE SKYLARK OF SPACE

Begins in August and continues for three consecutive issues.

SKYLARK THREE, By Edward E. Smith, Ph.D.

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The Conquest of the Earth

By Isaac R. Nathanson

(*Continued from page* 54)

Of course, there was great danger in handling the whole thing. Such vast forces could not be released without the possibility of its getting out of control altogether, and destroying the whole earth. But the condition of mankind was insufferable and, as far as one could foresee, the end was not yet. Far better a thousand deaths than to be dominated and driven about like wild beasts. It was solemnly decided, that come what will, here was a weapon that offered the only possible salvation—a most terrible, infinitely powerful weapon. The soul of Man rose to its supreme height.

The execution of the project called for a vast amount of labor and the highest technical skill in its preparation. But willing hands there were and keen brains; and desperation had increased everyone's energy. To bring about the desired result the atomic conflagration had to be started right in the midst of the enemy, preferably in many places at once. The technique of induction was a long and skilful process and required a specially trained technical knowledge, which few possessed. In fact, it was extremely difficult to induce this excitation, in view of the newness of the process, which, like all new discoveries, lacked refinements and improvements, such as only the years can develop. But once started the heat generated by the liberated forces within the atoms roared with an explosive fierceness, unapproachable and inextinguishable.

A selected number of highly skilled technicians, drawn from men of every nation and clime, were trained under Dr. Hopkins, who carefully and patiently imparted to them the difficult technique of the new discovery. Everywhere, in every place of refuge, in far-off lands of the world, men and women labored—grimly, tirelessly and determinedly. It took over a year to complete the full preparations.

A day came when all was in readiness. As night descended with its enshrouding mantle over the different parts of the earth, those entrusted with the final execution of the great strategy fared forth. Several scores of the new racing planes, each starting from a specifically selected point, sped straight for the enemy. In the darkness, at a tremendous height, they raced on at over six hundred miles an hour toward their definite objectives. It was a very dangerous undertaking. The population of the Andromedans had by now become very dense. In many selected spots, free of the enemy, but in the heart of their territory, landing parties were to start the process which would release the intra-atomic forces. This usually took several hours; and probably only a few of the landing parties would succeed—but that was enough.

With palpitating hearts, with nerves strained to the breaking point, the result was awaited. Of the hundreds of planes, only twenty-three returned. They reported complete success.

HISTORY records that the last effort of mankind succeeded—1977 will forever go down as the year of The Great Deliverance.

In many places, in widely scattered parts right in the midst of the enemy, the irresistible atomic fires had been started. By the time the Andromedans had fully wakened to the full seriousness of their danger, the conflagration had spread to an extent there was no stopping. With all their knowledge, with all their science and skill, with all the tremendous power at their disposal, they were unable to quench the fiery spread.

Although the Andromedan civilization was much older and more developed in many ways, they had never succeeded in solving completely the problem of controlling intra-atomic energy. The energy which they utilized—the nature of which we never discovered, though most likely it was a partial tapping of atomic force—was powerful and terrible enough, and we had been unable to cope with it. But they knew not how to cope with or control this new fierce energy which we released. And it was this supreme stroke of human genius which finally overwhelmed them.

In vain they tried every method. In vain, with every means at their command, they strove to halt its deadly march. The blinding glare lit the skies; night could scarcely be told from day; roaring, deadly gases enveloped larger and larger areas. Until finally, the continuing spread of the all-devouring conflagration had grown to such proportions over such large areas that the Andromedans realized it was only a matter of time when they would all be consumed in its roaring flame.

They made a tremendous effort to escape from this earth. "Let Mankind perish in the fires which it started. A world suicide! When the atomic fires encircled the entire earth, a new star, bereft of all life, would announce itself in the firmament"—so they thought, as revealed by records they left behind. Their whole energies were devoted toward building vast numbers of their space-traveling globes, to take them back to their remote homeland. The clang and din of their hurried and desperate efforts to escape was a sight for the gods; the ever-spreading flames a constant urge.

And now the last of the Andromedans departed from the earth, with the deprecations and curses of all humanity. Many perished in the flames. The few remaining were put to death, as in their terribly disorganized state they could offer no adequate resistance.

Then began a race with the all-spreading atomic blaze. And here was where our complete preparations saved the earth for us. Mountainous quantities of the only substance capable of stopping the world conflagration had been manufactured and held in readiness. An entire willing humanity, young and old, buckled down to the herculean task of building barriers of this insulating stuff—which the Andromedans knew nothing of. Each area in the grip of the fiery disintegration was completely surrounded by these barriers, and when the flames reached these, they could spread no further. Everyone knew that in a few years the burning areas would gradually burn themselves out.

The hosannas, the thanksgiving that rose to high

(*Continued on page* 82)

The Feathered Detective

By A. Hyatt Verrill

(*Continued from page* 41)

imprints on both the door and the window-ledge? I could think of no good reason for the man's wet hands other that that it had been raining, and in climbing in by the window he had wet his hands. But quite obviously, had his hands been wet when he first entered the room, they would not have remained wet during the time that he crept on his dozing victim, strangled him, searched through his pockets and perhaps ripped open the bags before killing the bird.

"Moreover, the presence of the fingerprints on the door convinced me that he had decided to leave that way and had changed his mind and had gone by the window. Why should he have taken even that risk of going by the door? Rain, hard rain again, I decided. And your answers to my enquiries proved that it *had* rained, severely, during that night. I could not picture the murderer, soaked and dripping, climbing into the window to commit murder. Besides if it had been raining, the occupant of the room would, in all likelihood, have closed and bolted his window before he dozed off. Yet I felt sure the man who had killed the bird had just come in from the rain. I put two and two together and the answer was he must have left the room and returned to it after it began to rain. For what reason? In all probability to secure a tool or an instrument with which to cut open the bags. And you see, gentlemen, I *was* right in my deductions. But the credit is not mine. The credit should go to the bird, the feathered detective in the case, for had it been a parrot or any other bird on earth, the mystery might never have been solved."

"Well" says I, "I can see now what Big Ben meant when he said it was a most remarkable bird, in fact *the* most remarkable of birds."

"And he was right enough at that."

THE END

(*Continued from page* 81)

heaven have never been equaled. The frenzied joy at the great deliverance will go down in memory as long as the world lasts. The fires which the very soul of man had passed through had burned out the dross of the ages' old hatreds and divisions which had afflicted mankind from time immemorial; the narrow things and the petty were all wiped out. There would be enough for all.

THE END

In this department we shall discuss, every month, topics of interest to readers. The editors invite correspondence on all subjects directly or indirectly related to the stories appearing in this magazine. In case a special personal answer is required, a nominal fee of 25c to cover time and postage is required.

THE SCIENCE CORRESPONDENCE CLUB

Editor, AMAZING STORIES:

Below is given another report of the *Science Correspondence Club*.

In previous reports to the Discussions columns of AMAZING STORIES, my letters have been rather vague in furnishing definite information to readers who may wish to join the Science Correspondence Club. Therefore, quoting from our Constitution, we give the following information which will interest your readers:

Article II

The institution will remain an organization to establish better co-ordination between the scientifically inclined laymen of the world, regardless of sex, creed, color, or race. There will be no restrictions as to age, providing the members can pass an examination which shall be prepared by the membership committee. Don't be alarmed by the word examination, as it really isn't an examination, but merely a glance into the prospective members' sincerity and capabilities. It embodies no question or form.

Let us look at Article IV.

The dues shall be $3.00 per annum and will go toward publication and distribution of the Club paper and a stipulated amount of stationery for each member

These are just two of the more important articles from the constitution which will be furnished free to every reader interested. Hitherto, I have been lax in expressing my sincerest appreciation to Dr. Sloane and AMAZING STORIES for the wonderful co-operation and reception of our club they have given. And here is a little bit of interesting information. Dr. Sloane has become an honorary member and the Club feels it has acquired a real scientist. In a previous letter I mentioned Dr. Breuer, Jack Williamson, and David Speaker as members in the Authors' class. What do I find when I look at the lists now? Harl Vincent, Robt. A. Wait, Chas. Cloukey, Ed. Earl Repp, Raymond A. Palmer have all enrolled and are giving their knowledge. Scientists? Dr. R. S. Rawson, M.D., John E. Mellish (Honorary) at Yonkers Observatory and nationally known telescope maker. Dr. Sloane (Honorary) Mr Hugo Gernsback, and that greatest of amateur astronomers, F. B. Cason

Truly, Science Fiction, through the aid of AMAZING STORIES and its sister publications, is going to be recognized as the greatest medium to spread Science instructively and recreationally at the same time. And it is the aim of the Science Correspondence Club to spread science by personal contact of the laymen of the world. To this end the founders of this club are devoting their lives. And what greater and better thing can be said of anyone, "He helped his fellowmen."

Remember,

Mr. Raymond A. Palmer,
1431 38th St., Milwaukee, Wis.

Will handle all applications for membership and furnish information promptly. Help us make 1930 a year to be remembered in the S. C. C.

Walter L. Dennis,
4653 Addison St., Chicago, Ill.

(We are more than pleased to publish this report. The Club has made a wonderful start and we shall hold our columns open for further statements of general interest to our readers and to prospective members.—EDITOR.)

THE S. C. C. AND AMAZING STORIES. COMMENTS ON THE MAGAZINE AS IT NOW APPEARS

Editor, AMAZING STORIES:

Mr. Dennis, whose letters have appeared in your publication, has subscribed my name as collaborator to several of the letters, therefore I feel that it is only proper that I write a letter to your publication in my own behalf, and that one about the Science Correspondence Club. Since so lucid an explanation of the purposes and aims of the Club has been given by Mr. Dennis, and several other members, I do not think it necessary that I follow their example. I only wish to speak to those who want to join the club.

The Club has taken great strides to the fulfillment of its wishes. We set a limit of 200 members for 1929, that is we looked forward to such a number, and now we find with gratification that we have over 200 members and many applications are pending. Every one of our officers and members is literally swamped with a sea of letters. However, this is a welcome burden.

We are indeed gratified that you have condescended to become an honorary member of our society. I am sure that you will find this club interesting, both as an individual and as editor of AMAZING STORIES.

Now I want to say something about a new policy of the AMAZING STORIES. I find it a better magazine than it was, and in one respect it has taken a tremendous change for the better. By this I mean the illustrations. I do not wish to belittle Paul's illustrations. I enjoyed them immensely, and I am sure every one of your many readers agree with me. However, I should say

(*Continued on page* 85)

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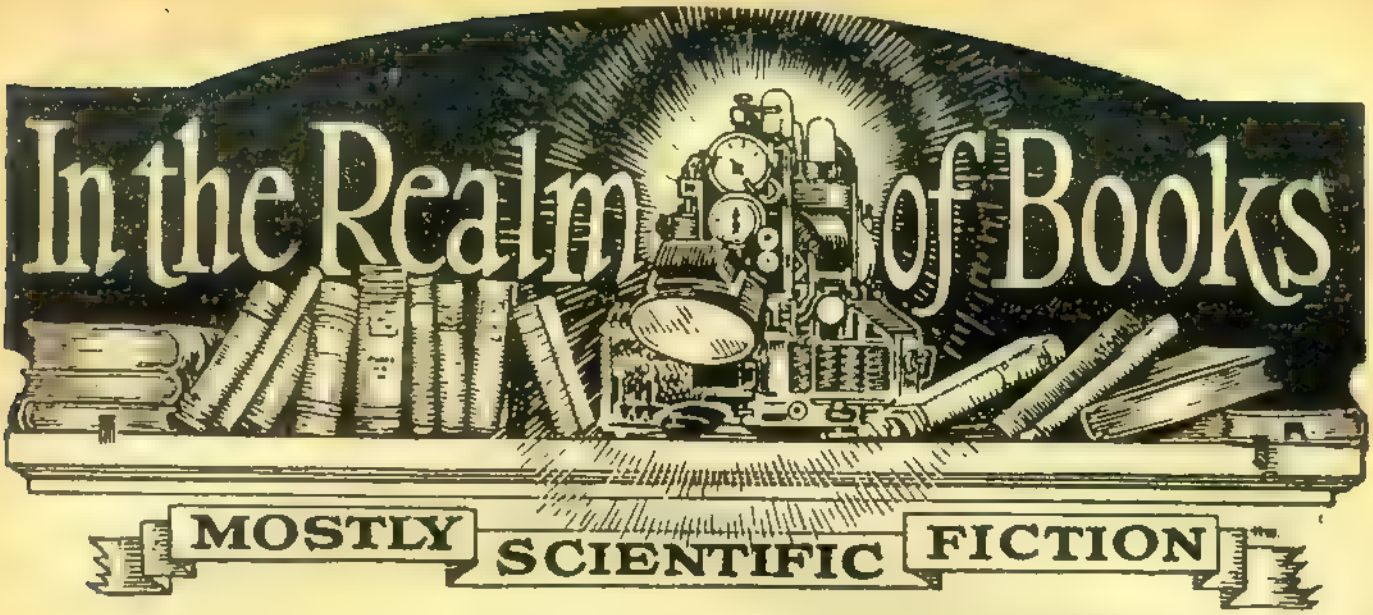

Page Darwin

"The Iron Star," by John Taine. Published by E. P. Dutton & Co., New York. $2.50

THIS new book by Mr. Taine is on a par with "The Gold Tooth" and the "Purple Sapphire." In certain respects it is even better, since it gives us a wonderful character study of one of these obnoxious reforming fanatics who are forever trying to force their views and beliefs down the throats of the unwilling.

One of the main figures in the book is one Swain, son of a revivalist, a narrow-minded, religious maniac, whose chief aim in life is the refuting of the Darwinian theory. Working on the well-known principle, "the end justfies the means," he first studies medicine, graduates with high honors, and then goes to the Congo as a missionary. Through his uncanny talent in learning the native dialects, he becomes head of a secret cult, whose aim is the extermination of all apes. Like all religious fanatics, he not only kills, but delights in torturing the poor helpless brutes, by burning them alive. But fate overtakes him. A Scotch explorer, McKay, a giant of a man, a scoffer and a heavy drinker, slyly introduces him to a mysterious substance, an incredibly heavy metal, which emanates rays of a peculiar nature. These rays or emanations first create a condition resembling complete intoxication and leave an insatiable craving for additional doses. At the same time, these rays change the chemical composition of all the glands in the body; they stimulate the glands responsible for growth, but reverse the effects of the glands governing the manifestations of brain and soul. In other words, the addicts turn back to a state below that of the apes.

Swain's wife and daughter succumb to the insidious rays. McKay, who in the meantime found the chief source of the mysterious substance in a vast meteoric deposit, is himself succumbing, but still has reason enough left to dispatch Swain to Chicago in order to summon scientists to destroy this substance. Swain goes to Chicago, meets several scientists, who become interested in his case without knowing the entire truth and an expedition is started for the Congo. There Swain disappears, but is tracked to a valley containing a cavern, where they find a large quantity of this heavy substance. While they are watching Swain remove a small fragment of it, they are attacked by a large gang of near-human ape-like creatures under leadership of a truly gigantic male, whom they dub "The Captain." A few of the gang, not in harmony with the "Captain," are killed forthwith and then the Captain's reason snaps and he kills the entire gang singlehanded. The Captain gets his arm shattered and mutely applies for help. He gets medical attention and thereafter is their friend, guide and ally. The scientists, in the meantime, have examined the mysterious heavy substance, and classed it as an entirely new element, hitherto unknown upon the earth, which they name "Asterium." The Captain, who has degenerated so far that he is without speech, displays the greatest aversion to "Asterium," and leads them to another large deposit of this substance. Here the emanations are very strong, but they manage to set up an X-ray machine and succeed in disintegrating the asterium, which explodes with terrific force. The disintegrating once started cannot be stopped and as the asterium permeates the whole countryside, a cataclysm of horrible grandeur takes place. The expedition survives, however, though the Captain is killed. The survivors finally land safely in Chicago, where a letter left by Swain furnishes the necessary explanations.

"The Iron Star" is a very entertaining book, which can honestly be recommended to all lovers of fantastic literature.—C. A. B.

Mystic Stories

"Others Who Returned," by H. R. Wakefield, published by D. Appleton & Co., New York. $2.00.

THIS volume contains 15 stories, which will be welcomed by the mystically inclined and condemned by those whose minds demand an explanation. Mr. Wakefield's style is very agreeable and reads well. Some of the stories are pathetically touching and beautiful, as for instance "Present at the End." All of the stories are charmingly written and very ably constructed. They contain descriptions of unexplained mysteries and accidents, leading to unsolved deaths, transmitted taints and evil influences, which continue beyond the grave, but all without any explanation whatever. It is absolutely "up" to the reader to furnish the explanation, if he can. For that reason it must appeal to the mystic.—C. A. B.

A Satirical Novel

"Deutschland Ohne Deutsche" (Germany without Germans), by Hans Heyck. Published by L. Staackmann, Leipzig, Germany. $2.00.

THE German publishers have adopted the American custom of furnishing a short synopsis on the inside jacket of the book. To me it seems a good custom. Most of the German jackets praise their books profusely and almost all titles are misleading; superlatives and super-superlatives are employed with a deplorable lavishness. The book is advertised as a satire of the importance of a work of Swift's. It is, they say, a mirror of the future, and a picture of humanity in gigantic dimensions. Looking at the book, with an unbiased eye, it seems to us a fairly well written, entertaining tale, dealing with a Germany submerged in a sea of foreign immigrants, chiefly negroes, and in the hands of exploiting coteries of rich adventurers, who have succeeded in a general standardization of everything. Even before the World War, anything foreign—all foreign customs and habits—were looked upon with awe and respect. This deplorable weakness got worse after the war and "Deutschland Ohne Deutsche" shows unmistakable signs of it. But, perhaps it is only the much-mentioned satire. Let us give Herr Heyck the benefit of the doubt.

The story deals with the project of driving a tunnel through the centre of the earth to connect Australia with Europe. This project has been proposed by a German Engineer called "Big Linus." (Like most of the newer German books, this one is also amply laced with all kinds of English expressions.) Big Linus, a multimillionaire, works secretly to solve the problem of how to recreate a new Germany by secretly segregating all good and true Germans in the northern part of Sweden and Finland, which he bought outright. His nephew, as his heir who is supposed to carry on this project, has to flee from Germany after having fallen foul of their laws. He safely lands in Sweden, while the tunnel blows up through volcanic eruptions.

The technical part, describing the construction of the tunnel, is well handled. The rest failed to impress.—C. A. B.

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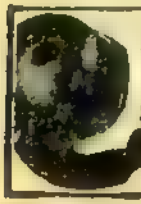

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that Paul has the architects' viewpoint. He sees things as matters of lines and surfaces. In drawing scientific machinery, with only his imagination as his guide, he is unexcelled. It is however his failing that he has standardized his people. You have perhaps noticed that all his people wear breeches which spread like those used in the cavalry. No doubt this is the artist's conception of people of the future, but it does not strike a convincing note. However your present artistic staff is fine. In particular, I find Briggs a fine artist. I can take up your magazine with the firm conviction that I will find in it the cream of scientific fiction.

I do not believe you have lost a single reader, and I know that you have gained many.

Can we have a few more stories by Wells? How about something from Burroughs, and Otis Adelbert Kline? The way your cover blends in all respects, color, and figures, is very pleasing to the eye, and I enjoy the conservatism of your colors. Mr. Dennis desires me to give you his regards.

Sidney Gerson,
1552 N. Kedzie Blvd., Chicago, Ill.

(Thank you for your letter. All we can say is that our staff, literary and artistic, is putting its best efforts into AMAZING STORIES. We hope you will continue to like it more and more. But always we must be guided by our readers and the only way we can do that is to continue to receive reports—as it were—from them on the various issues of both the Monthly and the Quarterly. We feel that the Science Correspondence Club has started its career in an auspicious manner. Long may it continue. We know you will find such men as Dr. Breuer, Harl Vincent and the more distinctively scientific men in your ranks, most valuable accessions as consulting scientists. We also know, personally, that most of the men whose names you mentioned will do what they can to help keep the Science Correspondence Club a *real* organization.—EDITOR.)

THE ROCKET IN INTERPLANETARY TRAVEL

Editor, AMAZING STORIES:

As one who has at odd times actually worked on what could be—theoretically—an agency for "interplanetary travel," may I put in a word on that matter?

Of all the purely kineto-mechanic ideas for a means to reach, say, the moon, or even farther, a rocket is by all means the most possible. But as Mr. Sloane rightly says, the acceleration-risk is a very real one. But, again, if my elevator experiences are at all normal, a person in any ascending mechanism loses the inertia-made increase of weight once inertia is overcome. So the rocket-ship appears not impossible.

My own experiments have been with the idea of changing ionic or atomic motion into mass motion in an electromagnet, and for amusement I have written two "interplanetary" tales on that basis. A hollow cylinder carrying in it its own power, would theoretically be capable, so excited, to continue its acceleration to the speed of "motion *per se*." Actually the limit even in space would be the crystallizing point. And as its crew would partake of the same acceleration no external inertia would act on them.

Our field, and a difficult one, for any author would be to write in first person a tale by, say, a Saturnian. I tried twice. Had fair success in one very short one, but in writing the same person's autobiograph—!—!—! Have worked on it off and on for eleven months; not half done. The difficulty is, to think and write as a Saturnian rather than a Terranean. There is the stumbling block, as Mr. H. P. Lovecraft points out.

How about stories of other dimensions? One, giving a theorem of a tesseract, was in its mechanical side excellent. Incidentally, certain wise ones in "Pre-Cometic Atlantis," and "Antillea," had a table of the "dimensions" up to either eighteen or twenty-one, and held that the seventh was directly accessible from the third.

L. Partridge,
Box 84, Cornish, Maine.

(It is hard to see or to conceive of any vehicle which would be driven through space, where there is virtually a vacuum, by any means other than reaction, and reaction we take as meaning rocket propulsion. At least this is a convenient way of expressing it. As regards the stories which you have been working on, we can only say to you, what we say to so many others, send them in to us and we will be delighted to have them read and to give them full consideration in our Editorial Department. We wish to have new authors for we want to keep the magazine very original and to avoid its being dry or dull or too mathematical. We hope that your suggestions will be taken up by some of our authors for they are really very good and original.—EDITOR.)

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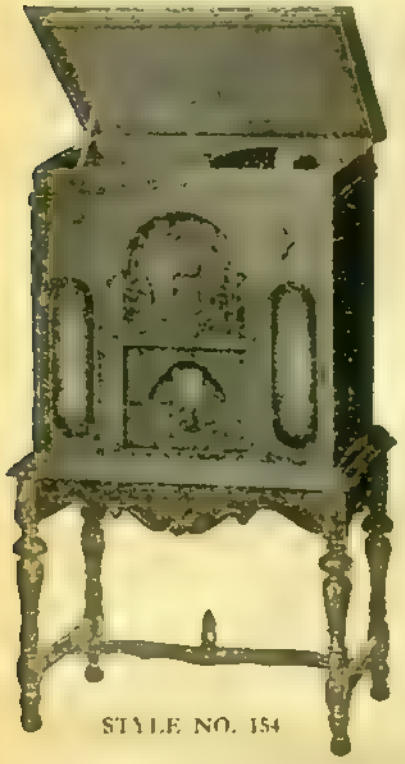

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A COMMENT ON DR LEMKIN'S STORY "COLD LIGHT"

Editor, AMAZING STORIES.

The story "Cold Light" in your November issue is a scientific and literary treat.

Geo. H. Davenport,
1430 West 32nd St., Los Angeles, Cal.

(The subject of cold light and the awful waste (and that is not too strong an expression) incidental to artificial illumination, has received so much attention of late years that we feel that our story "Cold Light" which you so highly appreciated was extremely timely, especially as it was written by one who thoroughly understands his subject. The incandescent lamp gives but a very small percentage back of the energy which it receives, in the shape of light. Of course it absorbs all the energy given to it, but a great part of the energy goes off as obscure invisible ether rays, if we may so term them, simply heat radiation using the old-fashioned term of what has been called classic physics.—EDITOR.)

SOMETHING ABOUT THE CORRESPONDENCE CLUB—THEORY OF THE AURORA BOREALIS

Editor, AMAZING STORIES:

I will pass over the elaborate praise indulged in by most of your correspondents, because they seem to have about used up all the adjectives in the language. And anyway, the old "A. S." can stand on its own merit, and it won't be in the back row, either.

I have a problem I believe you can help me with, if you will; here it is:

In collaboration with Walter Dennis, of Chicago, I have evolved an hypothesis as to the origin of the "Aurora Borealis," which we believe to be entirely original and which seems to fit every known fact. Would you advise me to seek recognition of it by some national astronomical society, or would it be better to send it to a magazine of science? Is there any merit award attached to a solution of this problem, such as honorary degrees, etc.? Now, a word about the Science Correspondence Club. We have over one hundred and thirty (130) members.

Don't you think it about time we got a little recognition? For instance, a page devoted to club business, such as: list of new members, address of officers, and feature the best article, discoveries, theories, etc., submitted each month by the members. Thus, each member would have an opportunity to present his ideas to the entire club, and any faults or fallacies, as well as good points, be immediately found, and argued pro and con by the correspondents.

Well-wishing and boosting for the "S. C. C." and "our" magazine, I remain,

E. W. Smith,
541½ Church St., Ottumwa, Iowa.

(There is no prize offered for the solution of such a problem as you speak of. If the solution was a wonderful triumph of science some degree of recognition would undoubtedly follow. We think you might correspond with one of the great observatories, such as The National Observatory of Washington or with the head of the Weather Bureau, and see if you could get them interested. It would be quite a triumph for the Correspondence Club if you could get adequate recognition of your work. We will take into consideration what you say about recognition of the Science Club. For the present you can do much by writing such letters as this telling us of your progress, which we consider quite remarkable. We will be glad to give you some space in the magazine to report your progress.—EDITOR.)

A TRIBUTE TO G. PEYTON WERTENBAKER FROM A BROTHER AUTHOR

Editor, AMAZING STORIES:

Every now and then you publish a really first-class piece of *Scientifiction;* one that ranks with the good literature of the day and is worthy of living in some more permanent form than the covers of a magazine. This time I wish to congratulate you on "The Chamber of Life," by G. Peyton Wertenbaker.

Scientifiction, primarily, must entertain. In that way it differs from science, which may or may not entertain; for the principal function of a scientific article is something far different from entertainment. But, in order that a short-story (by this term I mean the very specialized form of literature that has developed during the past fifty years) with a scientific foundation be entertaining, it has to fulfill some other rather stringent and difficult requirements. Some sort of a raving fancy, a wild, incoherent hodge-podge of machinery, or of stunts with rays or hypnotism or impossible apparatus, or some melodramatic adventures in the middle of

. . I Was the Life of the Party!

I FRANKLY admit that until recently I was about the most awkward blushing wallflower who ever dared to go to a party.

But my life has certainly changed. Instead of overhearing myself referred to as an "old oil can," it seems now as though the fellows and girls can't pay enough attention to me. Now every time the gang throw a party they insist that I come.

Don't think I'm bragging. I remember all too keenly what it felt like to be a lonesome dud in the midst of a lively crowd. And I'm so thankful to a certain Prof. Dunninger for my new found popularity that I am only too glad to give the credit where it belongs.

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South America or on Venus, among some caricatures of beings who express the inconsistencies of the author's psychology rather than any scientific principles—these things cannot possibly be entertaining to a person with an orderly mind, a scientific training and a taste for good literature. There are many such persons, and they deserve a good story now and then. Scientifiction can only entertain by sticking close enough to the orderliness of probability to resemble science at least superficially, and then by leading off the imagination of the reader on paths of exploration and speculation that actually do lead somewhere, without breaking his "imaginationary" neck.

Scientifiction has a definite mission in literature. To be successful, to receive the approbation of intelligent people, to *live* in the literary world, it must do one of three things: (1) It must express some new idea, some step forward in scientific imagination; it must look forward to what can be done, and probably will be done; (2) it must carry over scientific atmosphere and scientific information in a palatable form to the non-scientific reader. The busy man's best way of getting a whiff of geology is through a good geological scientifiction story; (3) or, it must display the [illegible] and scientific [illegible] all, the most interesting things about science are not its own facts, but what it does to people.

Mr. Wertenbaker has remarkably fulfilled the third, but especially the first of these requirements. I think his "Chamber of Life" is a brilliant conception. It is a perfection and idealization of what we try to accomplish when we read a story or a book, or go to a movie. It is *entertainment* carried to its highest refinement. In a way, it is but a simple, logical conception, merely one step in reasoning ahead of the sound-and-color movie, but that is what all really great things are: simple. It is the great and simple thing that moves us, not the vast, complex, labored efforts to soar and to cover the universe. Mr. Wertenbaker's idea certainly made a very powerful impression on my mind.

The other quality of excellence in his story is of course the workmanlike manner in which he put it together. I know nothing about him, and am quite curious to know if he is a professional writer. Correct short-story technic requires principally a proper knowledge of psychology; the psychology of the reader, and of the characters in the story. And Mr. Wertenbaker evidently has these, and has constructed a story that combines the two things that one does not see combined as often in scientifiction as one would like—a clever, original conception, and good story-technic.

I hope you can get more stories like it, both from him and from others like him.

Miles J Breuer,
Lincoln, Nebraska.

(This letter from Dr Breuer, whom we claim as one of our leading authors, tells its own story and requires no comments by us. Our satisfaction in it is based on the idea that so high an authority as its writer really agrees with the general methods of the editors of AMAZING STORIES, because we are not only trying to please our readers, but we are trying to do a good piece of work as regards science, literature, interest and romance, avoiding dryness and in spite of some transgressions, sticking pretty closely to correctness and making a very large allowance for the utilization of what may be termed "scientific impossibility."—EDITOR.)

AMAZING STORIES IN GLASGOW

Editor, AMAZING STORIES:

Having seen that readers from all parts of America take a part in your discussion column I thought you might like to hear from a reader in "Bonny Scotland." I get my copies of your magazine from the Woolworth Store in Glasgow. I noticed the name of your magazine and I thought that it was just another of those sensational trashy magazines that you sometimes hear of, but I confess I was entranced by your cover design. Sufficient to say I bought your August and September numbers and I did not stop until I had read them from cover to cover. I liked the "Red Peril" and Dr. Dressler's stories the best of the lot. I have passed the magazine on to some of my friends and they all thoroughly enjoyed it.

William McInarlik,
9 Tolleross Road,
Parkhead, Glasgow, Scotland

(The letter from the land of Robert Burns is highly appreciated. Of course, it is pleasant for us to know that AMAZING STORIES is read in other countries. There is even a sort of childish feeling about it that the further off the countries are the

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better. It is nice to feel that our magazine has traveled across the North Atlantic to your nice town of Glasgow of which the writer has very pleasant memories. It is many years since he was there and was in the basement of the Cathedral, where Rob Roy was in hiding. We thank you for your appreciation and note with interest that the cover attracted you. If you will look through our correspondence column you will see that no feature of AMAZING STORIES has been an object of so much criticism as the cover page illustration.—EDITOR.)

THE EINSTEIN THEORY FROM A STUDENT OF ITS LAWS—FOURTH DIMENSION STORIES

Editor, AMAZING STORIES:

Being a devoted reader of your periodical almost since its first appearance, I have had the opportunity to read nearly every story that you published dealing with the Fourth Dimension and other phases of the Einstein Theory of Relativity. These stories are always of especial interest to me, as relativity is a subject to which I have devoted several years of study.

In the latest (January) issue I see a letter from an English reader objecting to further publication of this type of story, claiming that Time-traveling and similar stories are unfair to H. G. Wells, whose "The Time Machine" was the first and best of this nature to be written. However, I cannot agree with your correspondent. I believe that if an author can offer a new suggestion on this subject, or make an improvement over older stories, he is certainly entitled to do so. And I will say that I have not yet read a single Fourth Dimension story that did not contain some new, original, and ingenious idea or suggestion. Of course, nearly every story of this nature you have published is at variance in some phase with every other story; and I have not yet found one which agrees with my own conception of the Fourth Dimension, outside of the statement that that dimension is Time. However, to get to the real purpose of this letter:

The most interesting Fourth Dimension stories I have read are those of Dr. Miles J. Breuer and Clare Winger Harris (I consider Mrs. Harris' "The Fifth Dimension" something of a masterpiece). Freshest in my memory is "A Baby on Neptune," which these two authors did jointly; but while it is a good enough tale, there is one rather objectionable phase that I feel urged to call to your attention. And that is: the "geodesic flyer."

Somewhere in the story it is stated that, "The geodesic flyer does not travel along a world-line That, of course, is merely a relative term of speech, and means, I presume, that the ship's world-line is changed from an angle incorporating both Space and Time, to one which runs parallel to the Time-dimension, so that the flyer is "at rest" in Space. Consequently the flyer's "motion" depends upon changing its state of inertia; that is, switching from a state of motion through Space, to a position of "rest." All very good—so far. But now come the objections.

Firstly, in describing how the *Neptunian* left the earth, the authors state that, "They had hardly begun to feel warm from the friction of the air, when they were out of it." Let me state that if the earth's atmosphere is, say, 92 miles deep, then the geodesic flyer spent five seconds within it—which is sufficient time to seriously damage the vessel and its occupants. For the very simple reason that the flyer could not leave the earth at a velocity greater than the planet's orbital speed of 18.5 miles per second. This can be readily perceived, since the flyer is at rest in Space, therefore *the flier is not leaving the earth*, but *the earth is leaving the flier*, and the planet's orbital velocity is the figure mentioned. Were the ship to depart from the earth at a greater speed, it would have to put on some form of power and thus travel along a world-line, which would again place it in danger of the meteors which it seeks to avoid. Incidentally the fact that the geodesic flyer is not on a world-line (meaning it is not traveling in space) would not save it from meteors traveling toward that point in space occupied by the vessel. For though the ship's path lies wholly in the Fourth Dimension (meaning it is traveling in Time only), the ship itself is in our familiar three-dimensional Euclidean Space; and as the world-lines of the meteors also extend into Time, they *could* intercept the path of the vessel and cause a collision. Perhaps my argument is not very clearly expressed; but if you are familiar with relativity I believe you will easily grasp the meaning and truth of my statements.

Secondly, in order to bring their "geodesic flyer" to a position of rest, the travelers would first have to apply a force which would hurl the ship from the earth (with reference to an ob-

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server on the planet) at a velocity of 18.5 miles per second in a direction opposite to that in which the planet is traveling. This suddenly applied force would crush the travelers to pulp.

A third objection is the time required to reach Neptune. In the story, as I recall, the time required for the journey is about 60 earthly days. As a matter of fact, the ship would actually be 262 days on the voyage, since its maximum velocity through the solar system is equal to the speed of the solar system through space—about 12 miles per second. This, of course, because the ship is waiting for the orbit of Neptune to catch up with it; and Neptune's orbit advances through space at the above-mentioned rate. Were the ship to travel through space at a speed of 16,000 miles per second, as stated near the beginning of the story, it would again be on a world-line traversing both Space and Time.

Fourthly: After reaching Neptune, the travelers would have to stay on that planet for half a Neptunian year, or 82 terrestrial ones, before they could undertake the voyage back to earth. This because the sun must advance toward Neptune's position in space in order to catch up with the geodesic flyer.

Fifthly: The geodesic flyer would never reach Neptune—or any other planet. This is because the orbits of the planets all lie in about the same plane, and the motion of the sun through space is more vertical to that plane than level with it. Hence the geodesic flyer, not partaking of the solar system's motion through space, would be left behind while the sun and all its planets moved away above it.

The story itself was very entertaining, and save for the above, I have no fault to find with it. But to my mind the geodesic flyer represents the pinnacle of inefficiency and foolhardiness. It were better if scientifiction authors stuck to the good old rockets and gravity-nullifiers. The characters then stand a better chance of getting around in the universe.

The mathematics in "Fourth Dimensional Space Penetrator" by Julian Kendig, Jr., were interesting, but, sad to relate, incorrect. Or rather, most of them were correct, but based upon false assumptions and therefore leading to false conclusions.

But I won't go into that now. This letter is long enough already. But before I close I want to compliment your artists. Wesso is as good as Paul, and his human figures look more like the real thing than Paul's. Morey is but little, if any, behind Wesso. Where's Clardy? He's good too. So's Hynd. And of course, Briggs is O. K.

Hoping you will give us more interplanetary and Fourth Dimension stories, and wishing you a mighty successful New Year.

Frank Brueckel, Jr.,
R. No. 1, Box 787, Sta. D, Milwaukee, Wis.

(It was said when Einstein's first paper came out, and it was a very short one and revolutionary in its results, that there were only twelve people who could understand it, and of these twelve, not one knew who the other eleven were. Of his recent paper, also a very short one, it is said of one eminent scientist, that he could understand the first page, but that the rest were beyond him. Your letter, however, in its criticism of fourth dimension stories interests us greatly, as your criticisms are based on your knowledge of this very abstract, or it may be called abstruse question of the Einstein theory. In other words, we consider your letter a sort of a little story in itself and we intend that remark distinctly as a compliment. It is interesting to note that so difficult a subject as the Einstein Theory has brought out such an interesting letter as yours. In discussing the artists, don't you agree with a big number of our readers—and with us—that there is a marked improvement?—EDITOR.)

STORIES BY FRANCIS FLAGG, JULES VERNE AND H. G. WELLS COMPARED

Editor, AMAZING STORIES:

In the latest issue of AMAZING STORIES I read a letter by one who disapproves of the stories about time machines because H. G. Wells was the first to write about them. On the same general principle I suppose one should frown on stories of rockets because undoubtedly Wells was one of the first to utilize a space-rocket in fiction. The Martians arrived on earth, in the *War of The Worlds*, by being shot at our planet in some such contrivance. Jules Verne in *Around The Moon* and *From the Earth to the Moon* has his daring voyagers shot from a cannon. As a matter of fact, it is foolish to frown on such types of stories because the point of departure for them has been used before. In literature it is largely recognized that there are only so many plots in existence, and all stories are rehashings of those basic plots. As

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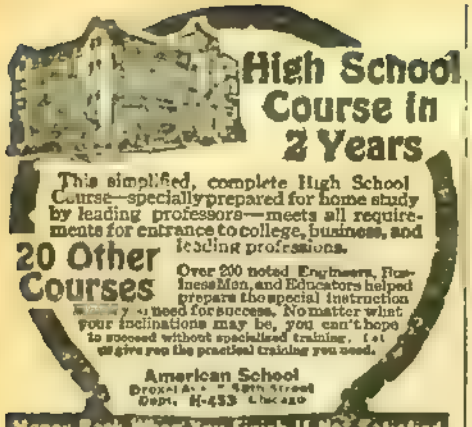

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for science fiction, one must expect the authors to encroach on each other's field. Not, of course, by plagiarizing (that is unforgivable) but by utilizing various mechanisms as their starting point into speculation. It seems to me that the thing to be asked in connection with every story is: Does it contribute something scientifically new to the various theories advanced? For after all, science fiction is supposed to advance our knowledge of science, and to give us interesting theories and speculations, based on known facts, to marvel and think over. Now I never read one of the stories mentioned by the writer of the letter in last issue of AMAZING STORIES, the January issue. But "The Master Ants" by Flagg I did read, and am at a loss to see wherein the author encroached so abominably on Wells. Wells' story, "The Time Machine," is an entirely different type of story from "The Master Ant." The only thing in common possessed by both stories is the use of a time machine to get to the future. But it is right here that Mr. Flagg introduces some interesting theories in relation to time and age not touched on by Wells. Time in its relation to space is graphically put, and age is shown to be engendered by the action of environment on the organism in a given period of time, not by time itself. I found this theory very interesting; and it is a valid one, based on exact science in connection with certain experiments by reputable scientists. Thus we readily see that Mr. Flagg makes a decided contribution to knowledge in his story. The travelers age, the machine falls to pieces from old age, Wells' time machine, despite its traveling in time for even a million years (you will recollect that the time traveler went ahead in time until the sun shone bleakly and the only sign of life was a something on the beach) never got out of order or needed repairing. Mr. Flagg was astute enough not to fall into such an error. I am not attempting to deny Mr. Wells (he is a favorite author of mine) the credit of being the first in this field of fiction; but in the name of commonsense why bar recent fiction on the same subject if it makes interesting contributions, not touched on before, to the general theory of time traveling? Of course mere rehashing, with nothing original advanced, should be frowned on. Well, now that is off my chest, Mr. Editor, let me say that I am strong for your splendid magazine. Some of the stories I don't care for; but then I realize others do; so I make no kick. My favorite authors to date are Vervill, Breuer, Keller, Harris, Flagg, and Wells. Flagg seems the most worthwhile right now, to me. Perhaps, as a mathematician, his speculations appeal more to me. I have wondered why you printed nothing by him lately. Hope he hasn't deserted your pages for "Weird Tales." Well, luck to AMAZING STORIES. As literature, some of its stories fall off; but as ideas. . . . . Well, the "mag" is there.

Stephen H. Stanish,
London Road, Oakland, Cal.

(We consider that our authors are quite original. There is a saying that there are only six or seven jokes in all this world and that the others are all built thereon. Something of the same sort may be taken as applying to stories. Perhaps there are only a few short stories that are really original and all others may have followed down the tracks started by them, but our authors are original. They do not copy and your criticisms are very welcome indeed as vindicating the originality of the works which we publish. As regards publishing a story by Mr. Flagg, the editors wish you could see the pile of material which they have on hand, and which is so good that they want to publish it all, but each manuscript must bide its [illegible])

THE ACTION OF A GRAVITY SCREEN DISCUSSED

Editor, AMAZING STORIES:

There has been considerable discussion in your magazine as to whether a gravity screen would cause the earth to lose its atmosphere.

In my opinion there are three effects that would prevent this from happening.

Take a screen as big as the original District of Columbia, 10 miles square (which is larger than the area of the ships in the story). Air up to about 10 miles above it would be fairly well screened from the earth's gravity. This air rises. When it gets 100 miles up, however, it is not screened from all the surrounding surface of the globe and the enormous weight under it. Obviously it cannot be attracted by matter in the frustro-pyramid under the screen. There would be a change in the isobaric lines over this area, but the air would not escape.

Suppose the screen was as big as the state of Pennsylvania. This would allow the air to rise much higher. The air as it starts to rise has the

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earth's rotation and planetary velocity. As it [illegible] it cannot gain more velocity, but as it gains in distance it will have to have a higher velocity to stay in the same radial line. Instead, the deserting air column would pass westward, and once clear of the screen, would be pulled down by gravity again.

Then if "Prof. Olsen" is right in saying gravity is an electromagnetic wave, it would close again behind the screen, as all waves do.

What effect would wave length have on this theory?

For interstellar rockets some means of locating and avoiding small dark bodies in space would be necessary. When the Mars Express leaves Manhattan Transfer far behind and begins to get up the terrific bullet velocity necessary to make the 35,000,000-mile trip in a month, it would spell disaster if even a small, slow-moving rock got in its way. A meteorite would be forced by its inertia to go from one end to the other, leaving several sizable holes at least.

Most meteorites are composed of iron and nickel, both magnetic metals. So some locater using magnetic or electrical means could spot them out. A delicate radio circuit might locate them by their capacity and its effect on the circuit.

Space is fairly empty, but it would only take one collision to stop the rocket. Your magazine is O. K.

S. P. Khotimlansky, Washington, D. C.

(We agree with you that if a space ship encountered a meteor, while it was going at the speed, which we have to assume that such a vessel would have, the consequences would be very sad. It would be like Stevenson's cow on the railroad track. He was asked in the early days of railroading what would happen if a cow got on the track in front of the engine, whereupon he said, "It would be very bad for the cow." The fact that meteorites are so often metallic in nature, and the other fact of the specific gravity of the earth being so high, lead to a probability that the center of the earth is largely metallic iron and nickel, so that the earth represents in a sense a great meteorite, with a thin crust covering it.—EDITOR.)

THE GRAVITY SCREEN AGAIN

Editor, AMAZING STORIES.

Although I have been a consistent reader of your publications since the days of the ELECTRICAL EXPERIMENTER, I have never written you. Of late years there are but few magazines that I find time to read, but I have not missed an issue of AMAZING STORIES, since it was first placed on the newsstands and I hope to enjoy it for many years to come. I will not attempt to name the authors or stories that I like best, as it would consume too much space, but I am glad you have stopped giving so much space to reprints, especially such stories as those of Jules Verne who, although a great author, is now decidedly out of date.

Now, just a word in criticism of Capt. S. P. Meek's story in the September issue. He states "——if a gravity screen were perfected—such a screen would rapidly exhaust all atmosphere from the earth." While it is true that a terrific updraft of air would be created as the screen rose, it would spread due to less pressure on the sides; also, the screen, unless covering thousands of miles of space, would not screen gravity to any great distance above it on account of the pull of the earth to either side of the screen.

C. A. Showman,
14713 Page Ave., Harvey, Ill.

(By inserting your very interesting letter in the "Discussions Column" we think that we will bring it to the attention of Captain Meek. As we figure it, a gravity screen rising might have the effect of producing a sort of vacuum beneath it, which would in that case hold the air and not permit it to escape, the air rushing in to fill up the vacuous space generated by the motion of the screen through the atmosphere; but the whole thing is largely a phantasy because it still seems very doubtful if a real gravity screen in the true sense of the word will ever be evolved by mankind.—EDITOR.)

ONE WHO CALLS HIMSELF "A MERE BOY," WRITES AN EXCELLENT AND CRITICAL LETTER

Editor, AMAZING STORIES.

For quite a long time—about a year to be exact—I wanted to tell you what I thought about your magazine. Though I am only a mere boy, a "very" mere boy, I feel it my duty to inform you of your danger.

In the good old days when the AMAZING STORIES was still young I borrowed my first copy. The most interesting story in that first issue, and all subsequent issues too, was "The Moon Pool." Why don't we see more of A. Merritt? Has he stopped writing or has he died?

There are many stories that I liked in

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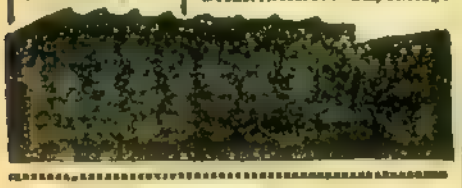

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AMAZING STORIES. Most of them are from long ago. Here they are: "The Moon Pool," "The Land that Time Forgot," "The Second Deluge," "The Master Mind of Mars," "The Nth Man," "The Skylark of Space," and "The Vanguard of Venus." All these stories had a scientific background. A word about this scientific background.

During the last few months AMAZING STORIES has been degenerating into a magazine with a scientific foreground and a fiction background.

David Keller, M.D., appeals to me particularly, although his stories are not of the action variety. I did not mention any of Keller's works in the list I gave because they make up a list by themselves.

Wesso is as good a substitute for Paul as one might wish. Most of his drawings are on a par with those of Paul. Tell Wesso to keep up the good work.

If I see any of Merritt, Cummings or Burroughs in the forthcoming issues, I will take it as a personal favor to me and my friends.

M. Joseph Dickes,
(Address lost)

(AMAZING STORIES is supposed to be a magazine of scientific foreground and it is supposed to contain fiction stories with scientific backgrounds, so what is there to complain about in that regard? Dr. Keller is a very fine writer and he has the art of bringing a strong human element into the stories, and with it a touch of humor which is very advantageous and which gives them the real interest and grip upon the heart of the readers. We are sure you are going to like our art work after this. We have several excellent artists and everyone must agree that the figures—the pictures of the characters when shown in these drawings—are superior to any that were given in the earlier issues of AMAZING STORIES. Part of our work—and a very important part—has been by trial and sad experience to find really adequate artists to illustrate the text of the magazine.—EDITOR.)

A DEVOTED YOUNG READER GIVES HIS VIEWS

Editor, AMAZING STORIES:

I have long wanted to write to you, but have not been able to write until now. I have been reading your AMAZING STORIES since I was 10 years old and am now 14 years and have found this magazine the best in Scientifiction, in illustrations, and in poetry. I have written to you today to tell you the kinds of stories, authors, and illustrations I like. First of all I like A. Hyatt Verrill, David H. Keller and Harl Vincent best of all for their stories which combine everything—mystery, romance and thrills, action and adventure. The stories I have liked best, so far, are "Into the Green Prism" and its sequel, "Beyond the Green Prism," which has just started. "The Secret Kingdom" was good, but not as good as "The Skylark of Space," which I have read four times since it was published. "Mernos," by Henry James, also was a good story. Now that I have told you some of the stories I have liked I will tell you some of the stories I have hated. "The Revolt of the Pedestrians," was good, but it could never happen, some people might lose the use of their legs, but not all the world.

In the illustration there are hardly any automobiles on the street and if you say that the automobiles are on the lower level, how could the people have gotten out of their cars and walked up to the higher level when they did not have any legs. This shows the story to be impossible.

The letter of the twenty-fourth century should never have been published as it is not an amazing story at all, but a plain letter which describes nothing that will happen, but rather describes topics that we have right now, such as the radio, the telephone, the airplane and so forth. Now as to the illustrations, I think that Paul and Wesso ought to combine on each picture as one has got the qualities that the other hasn't. As I haven't any more time I am closing my letter.

Nathan Kaminsky,
26 Jefferson Street,
New York City

(We are always delighted to get letters from our younger readers although one of the attributes of youth is to criticize very severely. One's views get softened by the passage of years, but in this letter our correspondent treats us rather well. As regards combining artists, our experience is that they are rather a sensitive set of human beings and would resist any such combination as you suggest. In conclusion as you have been reading AMAZING STORIES since you were ten years old and like it so much, we hope that you will stay with us for many another long year.—EDITOR.)

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THE CORRECT DEFINITION OF TIME-TRAVELING

Editor, AMAZING STORIES:

I am writing to the Discussions in order to discuss with you the probability of time-traveling.

It has been done. It is being done. We are traveling into the future at every second. But *real* time-traveling is to either go backwards, not forward in time, or to accelerate our rate of traveling forward.

Both of these have been done. Here's how: If you were to go on a ship, and travel to Europe, you would gain a few hours. Travelers to Europe have to turn their watches ahead about five hours for the ocean trip—actual proof that they have gained a few hours. If you were to go around the world, from *west* to *east*, you would gain a day. (Jules Verne's book, "Around the World in Eighty Days.")

If you were to go around the world from *east* to *west* you would *lose* a day. But how could this be possible, if all the while, you are traveling *forward* in time? In order to lose a day, you would have to travel *backwards* in time, not forward, as we are constantly doing. Simply, it cannot be possible to travel both *backwards and forwards* at the *same time* along time. Yet, the fact remains, that it may be possible to do so. But how? Isn't there an explanation for this? Apparently not.

Let us assume that time is the fourth dimension, as many of your writers have it. If we travel in time, either backwards or forwards, we are still traveling in three dimensions. Therefore, the fourth dimension is contained in the three dimensions! But if that is so, then three dimensions are contained in two! And two in one! And one, in—what? Nothing! Impossibilities! But anyway, something of this is true. The first part, at least. And how do you explain that?

In closing, I will say that the best fourth-dimensional story I ever read is "Paradox" by Cloukey.

M. Miller,
1489 Southern Blvd., Bronx, N. Y.

(Owing to the difference of time, if you go around the world in one direction you are said to lose a day, or in another direction to gain a day. This merely means that the day in one direction of travel is shorter than the true day, shorter than when we travel in the other direction, and *vice versa*. There is no real gain or loss, except in this numerical number of days. A good illustration is that if you go across the ocean in a modern high speed steamship in one direction—going east—each day is about 23 hours in length. Coming in the other direction—to the west—each day is about 25 hours in length. But that merely refers to the alternation of light and darkness, of sunlight and night. Your watch will show the same number of hours. Edgar A. Poe has written a very amusing story on this theory, based on three Wednesdays in a week. You will find a story elaborating this theme in a somewhat early number of AMAZING STORIES.—EDITOR.)

A LETTER OF COMMENDATION—NO BRICKBATS

Editor, AMAZING STORIES:

I would like to say a little about what I have read in the December issue of AMAZING STORIES. When I finished reading "The Twenty-First Century Limited," I considered it one of the best interplanetary stories I have read for some time. I had the feeling that I was a person living in 2028 and reading it as a present day fiction story.

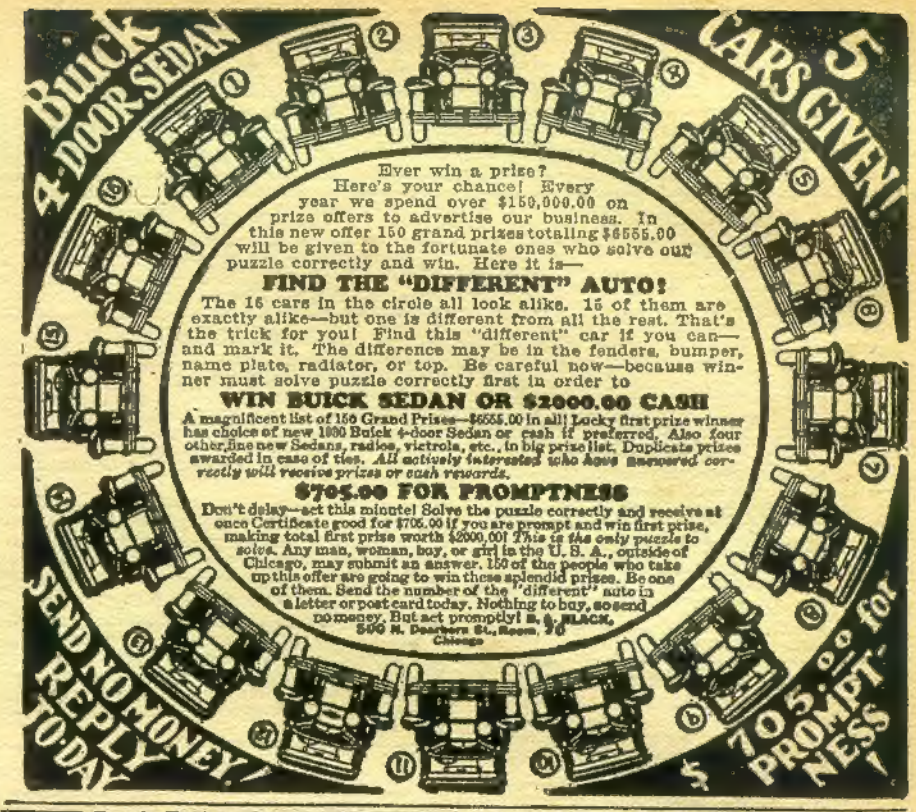
I also read the last installment of "The Secret Kingdom," but consider it out of place in AMAZING STORIES. It was a good story in its place and held interest to the last.

Let's have Paul Slackta write a sequel to his story about the proposed trip to Mars with Rayand Dana and have it just as interesting.

P.S.—By all means keep Wesso and Morey as illustrators.

Junior Harbaugh,
1104 Virginia Avenue,
Hagerstown, Maryland

(There certainly was a great deal of vigor and life in the story "The 21st Century Limited" and we shall hope to get more, perhaps equally good, stories from the same author. You will find that much of our art work is being done by Wesso and Morey and these we consider exceptionally good artists and their figure work, the presentation of the characters of the story, so far has been particularly good. We can assure you that the editors are the severest critics that our artists have and we can only say that they stand our scolding rather well.—EDITOR.)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SUGGESTIONS FOR A STORY SUPPOSED TO BE TOLD BY A SATURNIAN

Editor, AMAZING STORIES:

Permit me to say that the January number is as good as any two previous which I have read. "When the Atoms Failed" was especially good, as was the second on the list I enclose.

The "Addenda" of the second story, however, were better omitted. It is accurate enough to make trouble for the police, who have too much as is. The story as a story was good, however.

In Campbell's story there was one rather comical slip that did not show up until my fourth reading. If Waterson's "Terrestrian" could reflect heat rays, how was the sun able to overheat it, heat alone being considered? This does not injure the story, in my estimation.

Some may consider the "super-integraph" of this story impossible. Personally, I do not, because "the squawky talkies" and radio television, much less possible even from a Spencerian science viewpoint, and wholly so from a mechanist-determinist viewpoint, are yet accomplished facts. This conceded, "Bartholomew" at once is included in the possibilities of science, with all the powers attributed in the story. And, the man who builds and uses the "super-integraph" is the destined Arbiter of Earth, willingly or no.

Why not get someone to write a tale of electro-mechanical astro-projection—a perfectly possible thing. Also, a story by, let us say, a Saturnian, relating the first visit by "Terrestrians." The non-human viewpoint might be a difficulty, however.

Leon Partridge,
Box 84, Cornish, Me.

(It is very hard for the editors who do so much work on each issue of the magazine, to state definitely that they consider one number far superior to the other. Comments of the nature of the one you give are not only agreeable—perhaps a little too flattering—but they are instructive. It is essential to get the opinion of outsiders on a magazine. All we can do is to pick out good stories and try to give them in an intelligent way, so as to avoid repetition of the same topic in the same issue and to get a proper distribution of length of stories, that is to say, to give a proper number of stories in each issue. Your suggestion about Saturn is a very good one. Just imagine what that planet would supply in the way of a view of the sky with the great rings surrounding it at so short a distance from its surface, like a multitude of moons. Saturn is so large and the rings are so close that their velocity of rotation is very high and the prospect it would afford would seem to be very superb. We especially like criticisms from our young readers.—EDITOR.)

A FRIENDLY LETTER FROM A YOUNG READER

Editor, AMAZING STORIES:

Although this is my first attempt at writing you I feel free to express my opinion of your stories and the letters criticizing them also.

Your magazine, taken as a whole, is the best on the stands today without exception. I have been reading it since I first saw it about two and a half years ago. The Interplanetary stories are wonderful and I look for them in every issue. Let's have some more like "The Skylark of Space." The Fourth Dimensional stories are next, "Microcosmic Buccaneers" being especially good. Among the other stories high in my estimation are: "The Dimension Segregator," "The Last Man," "Futility," "Armageddon-2419" and its sequel "Airloads of Han," "The Superperfect Bride" and "The Purple Death."

And now the criticism of your criticizers. First, there are no perfect humans. We have to allow for certain mistakes of our authors and try to profit by them.

Second, if there were no so-called impossibilities in the stories, would they be nearly so interesting? The things that are now considered impossible will probably be common events a few years in the future. Twenty-five years ago it was considered impossible for a man to fly in a heavier-than-air machine.

In reference to propulsion by rockets in interplanetary travel. Supposing that a rocket's motor would not propel an air vessel through a vacuum. Have we proof that space outside of the atmosphere of the earth is a vacuum? Scientists call it "Ether," because they do not know what it is. (Correct me if I am wrong in this statement.) Most people consider space a vacuum for the same reason, they do not know what it is.

In the November issue, which I have just finished, Ronald Scribner's letter gives me a good deal to think about. In one place he says, if we were to travel faster than the speed of light, that

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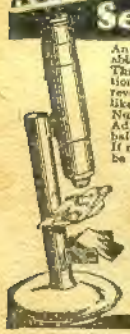

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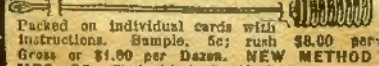

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MONEY

we would eventually see the Battle of Waterloo re-enacted but in the reverse order. Would you mind explaining that statement, Ronald?

I have enjoyed this issue of your magazine more than any issue in a long time. I am 17 years old and am in High School where I took a course in physics last year. It has changed my views of science very much. In closing, I will say that AMAZING STORIES is the magazine for people who, in any way, are interested in science. It imparts a greater understanding of science and gives a broad field to the imagination. These people who are always finding some little point wrong in the stories—why don't they quit complaining and let the rest of us enjoy the magazine?

C. L. Granger, Jr.,
308 Commonwealth Ave., Charlotte, N. C.

(With reference to your opening statement, we hope that your first attempt at writing to us will not be your last. You will not find many mistakes in our magazines. They are watched for most carefully, but as you say or imply, none of us are perfect, so there are bound to be some errors. Seeming impossibilities are perfectly in place in the stories. They certainly will make them interesting and as you say impossibilities become possibilities in the development of human science and intelligence. Not only would a rocket propel an air vessel through a vacuum, but the action of the rocket would be far better in a vacuum than in the air. Once the rocket got the airship going and lifted it out of the earth atmosphere into the vacuum of space, a minimum effort or very slight action would be required to keep it traveling indefinitely except for gravitation, because in the absence of air there would be nothing to stop it from going. The battle of Waterloo in a sense might be assumed to be visible if one could travel through space fast enough to catch up with the rays of light which left it in 1815 over a hundred years ago. But, owing to the distance which they would travel, these rays of light would diminish so in intensity that it is probable if we did the almost absurd act of catching up with them, that they would be too weak to affect the human eye.

We thank you for your expression of appreciation for what we are doing.—EDITOR.)

BACK NUMBERS WANTED BY A CORRESPONDENT

Editor, AMAZING STORIES:

I am writing to find out if you have any issues on hand containing "The Moon of Doom" and "When the Sleeper Wakes." These two stories were in the first issue of AMAZING STORIES QUARTERLY.

I would also like information regarding "Station X," "The Moon Pool" and "Around the Universe." These stories I believe were in the earlier issues of the monthly.

Also I would like to know if you have any more Annuals. If so what is the price and what are the stories in them.

P.S.—I have read so much of these stories in your "Discussion" column in both the Quarterly and Monthly, that I am dying of suspense already.

Ernest Schilbersky,
25-68 Seventh Avenue,
Astoria, Long Island, N. Y.

(The information you ask for you can obtain by addressing the Subscripition Dept., of AMAZING STORIES at this address, when you will receive an immediate answer. Many of our old copies are out of print but you will find among our correspondents in the "Discussion Columns" several who say that they have old copies for sale. The magazine has proved so popular that many of the early issues are completely sold out. We are only sorry that we did not print more so as to take care of the unanticipated demand.—EDITOR.)

A SET OF AMAZING STORIES FOR SALE

Editor, AMAZING STORIES:

Kindly print this in your Discussions Column. I would appreciate it very much. I have a complete set of AMAZING STORIES since April, 1926, to the current issue. I would like to dispose of them at one time.

Is it necessary for me to add that AMAZING STORIES is a great magazine and that I will continue to read it with unfailing enthusiasm? Thank you.

Joseph Fox,
2628 S. Beulah St.,
Philadelphia, Pa.

(Your last words are "Thank you." We feel that the thanks are due to you from us, so you will let us repeat what you said and thank you.—EDITOR.)

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MACKINNON-FLY NEWS BULLETIN

DR. NIKOLA TESLA MAPS AMAZING ELECTRICAL WORLD OF FUTURE

Wireless Power, Simplified Television, Cathode Rays to Revolutionize Our Homes and Industries

Dr. Nikola Tesla

Dr. Nikola Tesla, perhaps the greatest electrical wizard alive today, forecasts the astounding electrical future of the world, not as an imaginative "philosopher" but as an experimenter and exact calculator.

"Were we to eliminate from our industrial world the results of Mr. Tesla's work, the wheels of industry would cease to turn, our electric trains and cars would stop, our towns would be dark, our mills dead and idle." Thus does Dr. B. A Behrend sum up the far-reaching effects of Dr. Tesla's great inventions.

Now this genius who first created man-made lighthing, filament-less vacuum lamps, induction motors, etc., predicts miraculous revolutionary developments in the electrical world.

He predicts homes, offices and factories throughout the world will shortly be using filament-less lamps which throw a light of indescribable beauty. He predicts amazingly simplified television—bladeless turbines—the wireless transmission of electrical power to homes and factories—world-encircling aircraft electrically driven—high potential cathode rays that will penetrate through miles of solid substances—and many other inventions which may sound like miracles to you now, but which will become surprisingly plausible when you read the fascinating article, especially authorized and approved by Dr. Tesla, in the April SCIENCE & INVENTION. Buy your copy now—before the stands are sold out!

RACE PREJUDICE KILLED HER LOVE

Was He "Son of the Gods" Or Son of a Street-Walker?

Sam Lee was rich—a veritable prince in the American college world where money makes princes. Yet he was perhaps the loneliest young man among all the thoughtless people who flattered him, borrowed money from him, and felt for him the unreasoning hatred of the white man for the yellow.

The supreme disillusionment came to Sam Lee in the discovery that the girl he loved wanted of him only the success which his money could buy for her. For him she felt only physical repugnance—race hatred! Marriage with the son of a Chinese merchant was out of the question!

But he was "a prince from the colored clouds" and in the lives of princes strange things may happen, as you will learn when you read "Son of the Gods" the complete film version of Rex Beach's great novel, which appears in its entirety in April SCREEN BOOK. Now on sale!

GOLD IN ANTARCTICA

Little did the Commander dream that within a few hundred miles of his base, there ran a stream of water washing out raw gold from the Polar mountains. It remained for a fearless sailor, navigating a sailing ship alone, to reach that frozen country and uncover an astounding source of wealth. When the full story is disclosed, as it will be to readers of April BRIEF STORIES, under the title, "The Valley of Red Night," the world will be caught breathless! Don't miss that story!

DOUBLE MURDER MYSTERY IN FLORIDA

In the latest news dispatch from Sandy Acres it was learned that Lindsey Carver, wealthy New York broker, was murdered or committed suicide on the same night that his former partner died of poisoning. Miss Carver was the first to discover the bodies of her father and his partner in the same room of their fishing lodge at Sandy Acres, but she could furnish few clews.

Murder evident, but possible motive mystifies authorities. All suspects being traced and prosecuting attorney promises exciting case. For complete details and the final outcome read April issue of COMPLETE DETECTIVE NOVEL.

THROWN OUT OF PLANE IN LOOP

Buddy Bushmeyer, world's premiere parachute jumper, vividly describes the heart-chilling sensation of being thrown out of a plane in a loop—tells what it feels like to jump at 12,000 feet elevation with a radio transmitter strapped to your back—and explains the technique of jumping with a telephone wire and talking to the plane overhead as you fall!

Buddy's hair-raising article is but one of many thrillers in the big April-May AERO NEWS AND MECHANICS. Amelia Earhart, Capt. Lewis A. Yancey, Grover Loening and other foremost authorities make this issue one of the most interesting magazines on the news-stands. Get your copy today.

NEW AMPLIFIER A RADIO MIRACLE

Loftin-White have once again come into the limelight of public esteem with the perfection of an entirely new system of audio-frequency amplification. With but two amplifier tubes and a single rectifier tube in the power supply, untold amounts of volume of a clarity never before approached have been obtained with their new method.

The invention opens an entirely new field for all radio men. Complete technical descriptions of the system, illustrated with diagrams, appear in April RADIO NEWS. Don't miss that issue!

ALL ON SALE NOW-BUY THEM TODAY!